

5 THE PEOPLE OF THE STATE OF CALIFORNIA,)
6 VS.) NUMBER 00F06871
7 PAUL EUGENE ROBINSON,)
8 Defendant.)

REPORTERS' TRANSCRIPT OF
11 DAILY PROCEEDINGS

MONDAY, DECEMBER 30, 2002

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20 State of California
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21 Deputy District Attorney

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I N D E X

MONDAY, DECEMBER 30, 2002:

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RANAJIT CHAKRABORTY

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1 MONDAY, DECEMBER 30, 2002

2 MORNING SESSION

3 ---oOo---

4 The matter of the People of the State of California
5 versus Paul Eugene Robinson, Defendant, Number 00F06871, came
6 on regularly this day before Honorable Peter Mering, Judge of
7 the Sacramento Superior Court District, State of California,
8 sitting in Department 30.

9 The People were represented by Anne-Marie Schubert,
10 Deputy District Attorney.

11 The Defendant, Paul Eugene Robinson, was personally
12 present and represented by David Lynch, Assistant Public
13 Defender and Robert Nelson, Assistant Public Defender, as his
14 counsel.

15 The following proceedings were then had:

16 COURT ATTENDANT: Please remain seated. Court is now
17 in session.

18 THE COURT: All right. Good morning --

19 MR. LYNCH: Good morning.

20 THE COURT: -- one and all.

21 MS. SCHUBERT: Good morning, Judge.

22 THE COURT: The record will show that Mr. Robinson is
23 present and his counsel, Mr. Lynch and Mr. Nelson, are also
24 available and present here in the courtroom. The People are
25 represented by Ms. Schubert.

26 We are proceeding to the hearing that the Court has
27 directed should occur concerning the -- the procedures or the
28 processes whereby the DNA identification evidence should --

1 how that should be applied in the case of a cold hit from a
2 database.

3 I just now received a copy of the People's supplemental
4 points and authorities. Is there something I need to read
5 before we get going or can I do that at the break?

6 MS. SCHUBERT: Well, Judge, I think it's probably
7 worthwhile during the break since Dr. Chakraborty is here and
8 on a timetable.

9 Essentially, this is a supplemental points asking the
10 Court to clarify what type of hearing this is called, whether
11 it's a Kelly hearing or 352 hearing or 402 hearing, and the
12 reason, more reiterated, why we do not believe this type of
13 hearing constitutes a Kelly hearing and why we should not be
14 required to put on a Kelly hearing. It is essentially, um, a
15 more clear record of our position with respect to the scope
16 of any type of evidentiary hearing.

17 I provided -- it should have been filed last Thursday.
18 I don't know what happened, but somewhere in the mix of
19 Christmas I suppose --

20 THE COURT: That wouldn't help me a lot since I was off
21 Thursday and Friday since there was so little happening here
22 in the courthouse. Um --

23 MR. LYNCH: Your Honor, my position is this: This is
24 just an attempt to re-litigate what we spent the last few
25 weeks litigating, getting a hearing. It's -- we --

26 MS. SCHUBERT: We have --

27 THE COURT: I think I indicated that I don't -- I
28 haven't given this a title.

1 MS. SCHUBERT: I know -- I know that, Judge.

2 THE COURT: It may end up being a form of a Kelly
3 hearing, but I -- it's certainly not a standard Kelly hearing
4 in the sense of testing the validity of DNA evidence in a
5 routine or historical context. But only as it relates to the
6 situation presented, at least in part in this case which is
7 the cold hit in a database and the various articles that have
8 suggested, there may be different formulas or different
9 theories that come into play when you use a database and you
10 get a cold hit out of a database.

11 So I want to -- I want to learn what the scientific
12 community in this field, what -- what is the generally
13 accepted or prevailing view of how you deal with that issue.
14 So whether it is called a mini-Kelly hearing, not going into
15 all of the fundamentals of DNA -- although I can't guarantee
16 that some of those will not play a role in understanding and
17 explaining the position of the various authorities who may
18 testify.

19 So -- but the focus is to find out what processes are
20 appropriate and what formula are appropriate in a -- in this
21 situation. Whether it's called a Kelly hearing or whether
22 it's called a 402-type hearing, it's -- it's a -- it's
23 obviously, in my view, an issue we have to understand and
24 resolve before we commence the trial.

25 So I don't know -- I will read this in due course, but
26 unless you feel it's essential that I do so -- as I say, we
27 have litigated the People's position and considered the
28 People's position that no hearing of any sort is required or

1 at least that certainly no Kelly hearing. But once again, I
2 don't think I am knowledgeable enough in this field, let
3 alone how knowledgeable I am about what Kelly means, but in
4 this particular field to give this a -- an appropriate title
5 at this time. I think after I have heard the evidence I may
6 be able to define what it is that I will be doing but it will
7 be a work in -- a process.

8 So it seems to me maybe the best thing for me is to
9 call our first witness and see what we can learn from the
10 witness.

11 MS. SCHUBERT: That's fine, Judge. We call
12 Dr. Chakraborty.

13 THE COURT: Good morning, sir.

14 THE WITNESS: Good morning.

15 THE CLERK: Do you solemnly swear that the testimony
16 you are about to give in the cause now pending before this
17 Court will be the truth, the whole truth, and nothing but the
18 truth, so help you God?

19 THE WITNESS: I do.

20 THE CLERK: You may have a seat in the witness stand,
21 please.

22 THE WITNESS: Uh-huh.

23 THE CLERK: And would you state your name and spell
24 your last name, please.

25 THE WITNESS: My name is Ranajit Chakraborty. The last
26 name, Chakraborty, spelled as C-h-a-k-r-a-b-o-r-t-y. First
27 name, Ranajit, R-a-n-a-j-i-t.

28 THE COURT: All right. Let us proceed.

1 MS. SCHUBERT: Thank you.

2 TESTIMONY OF

3 RANAJIT CHAKRABORTY, witness called on behalf of the People,

4 DIRECT EXAMINATION

5 BY ANNE-MARIE SCHUBERT, Deputy District Attorney:

6 Q. Good morning, Dr. Chakraborty.

7 A. Good morning.

8 Q. Can you tell us what your current occupation is?

9 A. I'm currently at University of Cincinnati College of
10 Medicine in the Department of Environmental Health, and I'm
11 the director of a new center called Center for Genome
12 Information. I'm also at the Department of Environmental
13 Health, I hold a distinguished professorship called Robert
14 Kehoe, professor -- K-e-h-o-e -- professor of environmental
15 genetics.

16 Q. I'm going to show you here what's marked as People's
17 Exhibit 20. Mr. Lynch has been given a copy. This is a
18 63-page document.

19 I will ask you if you recognize that document there?

20 A. Yes. This is a copy of my curriculum vitae.

21 Q. Curriculum vitae?

22 A. Included in that is my publications.

23 Q. Okay. Now, before I go into your CV I want to ask you
24 in terms of your work now for the University of Cincinnati,
25 what is -- what types of duties do you have there?

26 A. Well, at the Center for Genome Information, of which
27 I'm the director, we have chief responsibilities. We conduct
28 research to study role of genetics in complex diseases like

1 hypertension, asthma, cancer. So we are doing research for
2 discovering genes underlying susceptible to such diseases.

3 Second, we run a training program. We train
4 post-doctoral and pre-doctoral students in doing laboratory
5 as well as theoretical --

6 Q. Theoretical.

7 A. -- work for conduct such as research.

8 Third, we have also the responsibility of using this
9 basic science knowledge for solving several public health and
10 social problems.

11 For example, um, the three issues that are relevant
12 currently is how people can modify their lifestyle to be at
13 lower risk for complex diseases, if they have susceptible
14 genotypes.

15 Second, is how such basic science knowledge can be used
16 to distinguish the DNA from defined organisms and
17 application, of which I am becoming very imminent, in
18 combating bio-terrorism.

19 And third, to use these basic science knowledge to see
20 whether people can be identified for -- from biological
21 samples. One application is DNA forensics.

22 Q. Okay. Um, in terms of your area of expertise, would
23 you consider yourself to be a human population geneticist?

24 A. Yes. I classify myself as basically a human population
25 geneticist.

26 Q. What does it mean in simple terms?

27 A. Well, as a -- a -- as probably you are already aware,
28 genetics is a subject where we study how characteristics are

1 transferred from parent to children, that is a subject of
2 genetics. Human genetics is obviously genetics that relate
3 to humans, and one particular subsection of human genetics is
4 to use this knowledge as to transmission of characteristics
5 from one generation to the next.

6 What does a -- what application does in terms of
7 variation between people within as well as across
8 populations. That part we call population genetics to human
9 population. Genetics is basically a study of inherent
10 characters and to use them to study variations between
11 individuals within as well as across populations.

12 Q. To study variations between people, within people and
13 across populations?

14 A. Correct.

15 Q. Okay. Can you tell us in terms of your educational
16 background what that entails?

17 A. Well, my undergraduate and graduate degrees are in
18 statistics from an institution -- from an institute called
19 Indian Statistical Institute that is in Calcutta, India from
20 where I got bachelor degree in statistics with, of course,
21 applications in various fields like economics, biological
22 sciences, geological sciences and so on. Then I got master's
23 degree from the same institute with specialization in
24 mathematical genetics and -- and probability theory.

25 Q. Probability theory?

26 A. Correct.

27 Q. Okay.

28 A. And I did Ph.D in population genetics and biology from

1 the same institute.

2 Q. This particular institute, the Indian Statistical
3 Institute, is that some institution that is fairly well
4 known?

5 A. Yes. It is probably one of the world's best
6 institutions in training and -- in training and doing
7 research in statistics and its applications.

8 Q. Okay. What year did you receive your doctorate there?

9 A. I got my Ph.D in 1971.

10 Q. Okay. Now, in terms of subsequent to your educational
11 background you list here various awards and fellowships.
12 What -- first of all, what is a fellowship?

13 A. Well, fellowship is a honor given to students as well
14 as faculty members for -- for achieving something which is,
15 um, I would say, above average, if not the best in the field
16 at that time.

17 Q. Okay. Now, in terms of -- of your CV, you have listed
18 a number of them dating back to 1963 all the way up to 2001.
19 If you can, can you tell us what specific types of awards or
20 fellowships that you have received dealing with the area of,
21 um, DNA?

22 A. Well, dealing with DNA, um, I would mention couple of
23 honors that I had. In 1996 one of the Indian organizations
24 in North America awarded me the honor of man of the year
25 award that came from a cultural association called Cultural
26 Association of Bengal -- Cultural Association Of Bengal,
27 B-e-n-g-a-l, New York -- from New York. That citation said
28 that it is for my, "dynamic and constructive role in the

1 Bengali and Indian community." It is essentially, um,
2 because of my DNA work because during '94 and '95 I help in
3 solving some DNA forensic cases involving suspects from those
4 communities.

5 Q. Okay.

6 THE COURT: What communities are we talking about?

7 THE WITNESS: Um, from community from Eastern India,
8 Bengali.

9 THE COURT: Bengali?

10 THE WITNESS: Correct.

11 Q. (BY MS. SCHUBERT) That is spelled B-e-n-g-a-l-i?

12 A. Correct. The other award that relates to my work in
13 DNA is in 1998 Federal Bureau of Investigation, FBI, awarded
14 several scientists for their contribution in DNA forensics.
15 The citation for that award was for, "efforts of research in
16 DNA forensics during the decade of DNA, 1989 to 1998." It
17 was -- the award was given in 1998 because that was the
18 landmark year when CODIS combined DNA in their system, what
19 instituted at a national level.

20 Q. Okay.

21 THE COURT: What year was that?

22 THE WITNESS: 1998.

23 THE COURT: '98.

24 Q. (BY MS. SCHUBERT) Now, fair to say though that with
25 respect to awards or fellowships they are documented here on
26 pages 1 and 2 of your CV, the various different awards?

27 A. Correct.

28 Q. Okay. Now, in addition to that you have listed here,

1 um, academic appointments starting back in 1968 all the way
2 up to 2001. If you can tell us in terms of your history of
3 dealing with population genetics, what that is included?

4 A. Well, on page 2 through 3 under title of, Academic
5 appointments, several such items are listed. The ones that
6 relate to population genetics and DNA forensics transferred
7 back to the early '80s. In 1980 Swedish Government invited
8 me to look at their procedures for use of genetics in --

9 Q. In parentage testing?

10 A. Correct. So I was a member of the -- their ministry of
11 health to look at their procedures, to see whether they are
12 using scientifically valid and reliable procedures.

13 THE COURT: And these procedures relate to what
14 subject?

15 THE WITNESS: Um --

16 THE COURT: What procedures?

17 THE WITNESS: At that time they were using blood group
18 and protein markers for genetic typing.

19 THE COURT: Okay. But this was relating to the field
20 of identity, the identification process?

21 THE WITNESS: To the extent you could -- to answer
22 questions whether or not specific identified persons fathered
23 a child or not, parentage testing.

24 Then in 1989 a group was formed in this country
25 called -- at that time it use to be called TWGDAM.

26 Q. (BY MS. SCHUBERT) T-W-

27 A. T-W-G-D-A-M, standing for Technical Working Group on
28 DNA Analysis Methods. Um, at that time there were about

1 twenty-five to thirty laboratories across the country that
2 used to meet on a regular basis at venues selected by Federal
3 Bureau of Investigation Forensic Science Research Center at
4 Quantico.

5 So I -- I was a member of TWGDAM as a faculty member
6 giving lectures about the -- the laboratory as well as
7 statistical issues dealing with use of DNA in forensics. So
8 I got to advise them -- I continue to advise them in --
9 although the name of the organization now changed to SWGDAM,
10 Scientific Working Group on DNA Analysis Methods.

11 The other thing that happened was in 1993 an
12 international association was formed called International
13 Association of DNA Fingerprinting of which I'm a live member.
14 That organization, until 2002 -- 2000 -- until the year 2000,
15 organized a bi-yearly annual meeting, International
16 Conference of DNA Fingerprinting. I co-organized second and
17 third of those meetings.

18 From 1996 in this country private organization called
19 Cambridge Health Institute, CHI, hold their annual meeting of
20 international conference of identification and DNA forensics,
21 and I had been their scientific director since they started.

22 So apart from my normal academic duties these are the
23 additional work that I have been doing in the context of DNA
24 forensics and population genetics.

25 Two other things that I must mention that probably you
26 are aware. In 1994 the US Congress had an act called DNA
27 Act. One of the charter of the DNA Act was to look at the
28 issues of quality control and quality assurance of doing DNA

1 typing that could be used in DNA forensics and identity
2 testing. So FBI's director was chartered to institute a
3 review board to set up such standards, it is called -- it was
4 called DN -- National DNA Advisory Board, DAB. I was a
5 member of DAB since -- during its entire lifetime; 1995
6 through 2000.

7 Q. Okay. I'm going to --

8 A. In addition, the several state --

9 Q. States?

10 A. States --

11 THE COURT: States?

12 THE WITNESS: Yes. Correct. -- have their own such
13 review boards. One such state is New York. I'm a member of
14 the New York DNA subcommission since its inception.

15 Q. (BY MS. SCHUBERT) Okay. Now, I'm going to come back
16 to the DNA Advisory Board in a little while in terms of going
17 into more depth of what it is.

18 In terms of your academic appointments, the ones you
19 mentioned such as TWGDAM, SWGDAM, the DNA Advisory Board, do
20 those types of academic appointments create a forum of
21 discussion of various issues that are faced in forensics?

22 A. Correct.

23 Q. And are some of the forums, the meetings or
24 conferences, are there discussions that take place among
25 experts in the forensic field dealing with things such as
26 statistical interpretations?

27 A. Yes.

28 Q. Okay. Now, in terms of TWGDAM, when that existed -- I

1 don't know -- when did it switch from TWGDAM to SWGDAM?

2 A. I think the change occurred soon after DAB finished its
3 charter, so around '99 or 2000.

4 Q. Okay. Starting off with TWGDAM, what types of
5 professionals were you dealing with or interacting with
6 during your various TWGDAM meetings?

7 A. TWGDAM is essentially a community of forensic analysts,
8 they are technical directors, laboratory directors of state
9 or private laboratories which do DNA testing for identity --
10 identification purposes.

11 Q. Okay. Are the individuals, the professionals, some of
12 them included in TWGDAM, individuals such as population
13 geneticists?

14 A. Yes. What happens is when -- when agenda of a
15 particular meeting is decided upon, depending on the issues
16 to be discussed in that agenda, the -- the community invites
17 experts of the relevant field.

18 Q. Okay.

19 A. For example, TWGDAM or SWGDAM meets at least once
20 quarterly. At each meeting these days as a part of the
21 proceedings, since attendance of SWGDAM meetings are also
22 considered to be a part of continuing education for the
23 laboratory analysts, first they have some sessions of general
24 implications, so they invite faculty members. Normally I end
25 up being a lecturer in almost every meeting.

26 So apart from that then there -- the agenda includes
27 the current relevant issues that might change from time to
28 time as being simply laboratory protocol or dealing with

1 interpretation of complex cases or issues of statistics and
2 databases.

3 Q. Now, in terms of the types of individuals that have a
4 statistical expertise, can you name some of the other people
5 that you have interacted with through TWGDAM or SWGDAM that
6 have that background?

7 A. Well, through SWGDAM meetings we had, um, joined
8 presentations with scientists like George Carmoldy.

9 Q. Carmoldy?

10 A. C-a-r-m-o-l-b-y. He is a population geneticist from
11 Canada, helping the Canadian forensic community regarding
12 statistical issues.

13 Then Bruce Weir, W-e-i-r, he is a statistical
14 geneticist doing a considerable amount of work in DNA
15 forensics relating to statistics.

16 Barney Devlin, D-e-v-l-i-n, from Pittsburgh, he is also
17 a statistical geneticist who wrote a number of papers
18 relating to DNA forensics.

19 Then Bruce Budowle, he is the director of the FBI's
20 forensic science and research unit that relates to identity
21 testing.

22 THE COURT: Could I have that name again?

23 THE WITNESS: Bruce Budowle, B-u-d-o-w-l-e.

24 Q. (BY MS. SCHUBERT) And Bruce Budowle, he has a Ph.D,
25 correct?

26 A. Yes. He has a Ph.D in -- in -- in -- I think his
27 degree is in chemistry.

28 Q. Now, in terms of Dr. Budowle, I assume you have

1 interacted with him many times over the years?

2 A. Yes. With Bruce Budowle I am -- he is also my research
3 collaborator in the sense that from 1989 we have written
4 together more than a dozen papers.

5 Q. Okay. Does he have an area of expertise in the area of
6 population genetics?

7 A. I think he has a good working knowledge in population
8 genetics because from 1989 several of his papers dealt with
9 population genetic issues.

10 Q. Okay. And then in terms of other members, not just
11 population geneticists dealing with TWGDAM or SWGDAM, have
12 you dealt with just forensic scientists who are providing
13 statistical interpretations of various casework examples?

14 A. Yes. In factual -- as I said, one part of the SWGDAM
15 meetings is continuing education. So we give lectures where
16 forensic analysts attend so they can do -- do the statistical
17 computations correctly using computations that we have
18 recommended, and, second, who can make the interpretation.
19 So in that context, um, I virtually know almost every
20 technical leader of forensic laboratories in the country.

21 Q. When you say a "technical leader of a laboratory", what
22 does that mean?

23 A. For example, in California, Kenneth Konzak,
24 K-o-n-s-a -- um, z -- K-o-n-z-a-k -- Kenneth Konzak, he is
25 the leader of the DOJ laboratory in California.

26 Then I don't know the -- their designation in the
27 respective laboratory but, for example, Roger Kahn, K-a-h-n,
28 from Columbus, Ohio, he is also a frequent attendee of the

1 SWGDAM --

2 Q. Attendee.

3 A. And then Marcia Eisenberg from, um, a private
4 laboratory called Labcor, L-a-b-c-o-r, Labcor Operation, she
5 is also a regular attendee.

6 And Susan Nervenson from Arizona DPS Laboratory, she is
7 also a regular attendee of the SWGDAM meeting.

8 Q. Now, is it fair to say, Doctor, that through these
9 types of meetings, such as TWGDAM or SWGDAM, that you have a
10 sense of what the practice is in the community as to
11 statistical interpretations in forensic DNA cases?

12 A. Correct.

13 Q. Okay. Now, I'm going to go on to other parts of your
14 CV. You indicate here on page 3, Other professional
15 activities. If you could, um -- first of all, can you tell
16 us -- you have got indicated here that you're a member of the
17 Human Genome Center Study?

18 A. Correct.

19 Q. What is that?

20 A. Well, as you probably are aware we academicians, those
21 who are involved in academia, receive our research money
22 through funding agendas -- two major funding agendas;
23 National Institute of Health and National Science
24 Foundation.

25 National Institute of Health has its different
26 branches, one is the National Genome Center. So they -- each
27 of the units of National Institute of Health has their board
28 of reviewers who review grant proposals to see which grant

1 proposals are awarded the funding. So those are called
2 "study sections". So I was a member of the study sections of
3 the National Genome Center. My term expired -- these are
4 four-year terms. Currently I'm involved in another study
5 section like that of National Institute of Environmental
6 Health.

7 Q. Okay. Now, on your professional activities you also
8 list out a number of various professional activities that
9 deal specifically with the area of DNA and identity testing,
10 fair to say?

11 A. Yes.

12 Q. Can you just, um, relate for us approximately, um, when
13 the first one was that dealt with the professional activities
14 dealing with that?

15 A. Well, I mentioned that after the formation of the
16 International Association of DNA Fingerprinting in 1994 was
17 the second international conference held in Belo Horizonte,
18 Brazil. I co-organized that. That was in 199 -- sorry, not
19 1994, 1992.

20 Q. When you said -- you rattled off Belo, B-e-l-o,
21 Horizonte, H-o-r-i-z-o-n-t-e?

22 A. Correct.

23 Q. Okay. What type of conference was that in Brazil?

24 A. This was essentially the era when -- e-r-a -- era when
25 DNA forensics people were using restriction fragment length
26 polymorphism, RFLP. So the sessions of that conference dealt
27 with the procedures and interpretation of RFLP abbreviation
28 for restriction fragment length polymorphism, RFLP, data and

1 doing statistics for it.

2 Q. Okay.

3 A. And then my own presentation at that meeting was
4 regarding statistical analysis of several anthropological
5 defined population of RFLP, restriction fragment length
6 polymorphism, and they are compared -- they are comparison
7 with forensic databases.

8 Q. Okay. Now --

9 THE COURT: Do that again, they are comparison with
10 what?

11 THE WITNESS: Forensic databases.

12 THE COURT: Okay.

13 Q. (BY MS. SCHUBERT) Now, you also list out here that in
14 1994 you were the co-organizer of the Third International
15 Conference on DNA Fingerprinting in India?

16 A. Correct.

17 Q. Okay. Did that conference also deal with statistical
18 interpretation?

19 A. Right. And in the -- in fact, that was the time when
20 the S.T.R., when the short tandem repeat lucis --

21 Q. It's when -- I'm sorry. If I can repeat that. Correct
22 me if I'm wrong, what you said is when the short tandem
23 repeat lucis were being used?

24 A. Yes.

25 Q. S.T.R. is the acronym for short tandem repeat?

26 A. Yes.

27 Q. Then you have here listed in 1993, it looks like to
28 present, that you are a member of the DNA subcommittee in New

1 York State?

2 A. Yes.

3 Q. And what types of professional duties do you have with
4 respect to that subcommittee?

5 A. Well, the DNA subcommittees at the state level are
6 essentially the gatekeepers of DNA typing activity by the
7 state laboratories.

8 So in the -- in the New York DNA subcommittee our
9 duties include looking at the -- the monitoring of quality
10 control and quality assurances of the state laboratories.
11 Second -- which includes obviously the statistical
12 interpretation work.

13 Secondly, the -- at least once a year the subcommittee
14 meets with the laboratory directors at the state level where
15 they bring issues of -- of their important casework. It's
16 called the BIOTWG Group of New York, biological technical
17 working group. For example, in the last subcommittee meeting
18 the issue came up as to whether or not the -- there should be
19 an independent validation study of the interpretation of the
20 S.T.R. genotype Allele --

21 Q. Genotype a-1-1 --

22 A. Genotype allele, a-1-1-e-1-e, because --

23 Q. Okay.

24 A. So we discovered that issue which is essentially a
25 statistical issue.

26 Q. Now, at that type of like -- for instance, a
27 subcommission in New York, um, are there discussions at any
28 point with respect to issues dealing with the felon databank?

1 A. Yes. There had been discussions to the extent whether
2 or not the state laboratories are getting cold hits and how
3 they are presenting the cold hit cases in court.

4 Q. Okay. In terms of statistical interpretation?

5 A. Correct.

6 Q. Now, you also, in 1996, organized another conference in
7 Santa Fe, New Mexico?

8 A. Yes. That -- this is one of the CHI, Cambridge Health
9 Institute, meetings. This meeting held in 1996, I was the
10 scientific director as well.

11 Q. Okay. Now, I'm not going to go through all of these
12 here because you have a number of them listed out, but the
13 ones I want to focus on now in 1997 you indicate that you are
14 a member of the National Forensic DNA Review Board?

15 A. Yes.

16 Q. For the National Institute of Justice?

17 A. Yes.

18 Q. What does that mean?

19 A. Well, National Institute of Justice, like other
20 institutes, you have -- the national level has forums that
21 they distribute for research. So they are like the National
22 Institute of Health. They also have a board of reviewers or
23 study sections, I was a member of such a review board in
24 1997.

25 Q. So you essentially were reviewing grant proposals --

26 A. Correct.

27 Q. -- for various types of DNA work?

28 A. Yes.

1 Q. Okay. Now, you have also mentioned here that in 1999
2 you were a reviewer for the CODIS project -- CODIS -- in
3 Tennessee?

4 A. Yes.

5 Q. What does that entail?

6 A. Well, long before CODIS actually started when we were
7 in the SWGDAM or TWGDAM community we were discussing how
8 CODIS would be used. One of the uses of CODIS databases was
9 for offender database, to look for how to -- how to do the,
10 um -- how to devise an algorithm to search a specific DNA
11 profile.

12 Q. When you say how to devise an algorithm --

13 A. Yes.

14 Q. Okay.

15 A. How to search for a match.

16 Q. I see.

17 A. As the database increased and as multiple persons were
18 searching such databases for matches with respect to their
19 respective profile, the algorithm that we recommended became
20 very inefficient because the algorithm that we wrote in '94
21 or '95 required the database to be available to that
22 particular investigator at that point of time.

23 Now, if multiple persons are trying to use -- use our
24 algorithm, it required that the next investigator has to wait
25 until the first one finishes his or her job. That was
26 practically -- practically very inefficient.

27 So a group in University of Tennessee came up with this
28 suggestion that they can use a more modern computer

1 technology called parallel computation that they can use, so
2 the CODIS combined DNA system. They asked me to join a
3 review board to review their project to see whether that is
4 worthy of further support.

5 Q. Okay. Now, you mentioned here that as of 2001, an
6 issue that we already talked about, that you are an advisory
7 board member for the victim identification of the World Trade
8 Center incident?

9 A. Correct.

10 Q. What does that entail?

11 A. Well, the 9-11 episode of last year presented a number
12 of issues that are not standard cut and dry forensic issues.
13 For example, um, at least what happened in the two towers, we
14 do not know exactly how many individuals were victimized
15 and/or what population they do represent.

16 Second, the whole episode was such that within
17 literally hours of when the towers collapsed the biological
18 specimens went through circumstances that are far beyond the
19 usual complexities of a standard forensic case. As a
20 consequence a number of issues came up as to -- can the
21 current battery of forensic markers be used efficiently and
22 are they going to be enough to identify all of the victims.

23 Second issue of statistical relevance is when we do not
24 know who the victims are, how do we try to identify them.
25 Now, as soon as the episode became known people said, Well, I
26 lost my cousin somewhere. Some other person said, Well, I
27 lost my son without knowing the same person's cousin also
28 made the inquiry. So it was not a simple standard cut and

1 dry forensic case where we had to say that whether a
2 particular person fathered a child, it was multiple relatives
3 looking for this -- their same common relative. So
4 statistics becomes much more involved.

5 As a consequence, what happened was New York DNA
6 Examiner's Office are overseeing the work of the entire
7 project. They constituted different panels to help them with
8 suggestions of how to resolve the identification work quickly
9 and as reliably as possible.

10 I'm a member of a panel where mitochondrial DNA is
11 being used to identify the victims. In that respect, my
12 contribution to the World Trade Center episode is to look at
13 the mitochondrial data as far as victim identification is
14 concerned.

15 THE COURT: Could I have that word, micro --

16 MS. SCHUBERT: Mitochondrial?

17 THE WITNESS: M-i --

18 THE COURT: How do you spell it?

19 THE WITNESS: M-i-t-o-c-h-o-n-d-r-i-a-l.

20 THE COURT: Okay. Thank you.

21 Q. (BY MS. SCHUBERT) Now, in addition to your work with
22 the World Trade Center you've listed here a number of other
23 types of professional activities, both domestic, in the
24 United States, as well as internationally, correct?

25 A. Correct.

26 Q. What other countries would you -- would you tell us
27 that you've assisted with interpretation of statistical
28 issues for DNA Forensics?

1 A. Well, um, in like the United States, combined DNA index
2 system. In Canada there is a DNA forensic organized and run
3 by Royal Canadian Mounted Police. So I helped in my
4 interpretation of a couple of their DNA casework that, one,
5 related to the case where the evidence sample was alleged to
6 be mixture of DNA from several persons.

7 Q. Let me back up for a second. What you are indicating
8 is in Canada they also have a system similar to the CODIS
9 system here?

10 A. Correct.

11 Q. A felon databank?

12 A. Yes.

13 Q. And you have assisted them with the interpretation of
14 cases in Canada?

15 A. Correct. The second case that I helped the RCMP with
16 was the suspect was from a community that was not included in
17 their population database. The suspect was of Indian origin,
18 and at that time the Royal Canadian Mounted Police did not
19 have a significant Indian component in their population
20 databases. So the question arose as to what kind of
21 statistics can we give in that casework.

22 Q. Now, that particular case, was that a -- a case where
23 someone was identified through the felon databank?

24 A. No.

25 Q. That was essentially a separate issue.

26 A felon databank casework where you are looking at the
27 population databases --

28 A. Correct.

1 Q. -- as opposed to the felon databank?

2 A. Correct. So the -- the other international assistance
3 that I had was more in the context of not specific casework
4 analysis but more in terms of what can be done in those
5 countries.

6 For example, last month I was in Columbia where the
7 Colombian Government is now considering to set up databases
8 like the felon database here, and they have selected six
9 laboratories to do it. So we met with the six laboratory
10 directors and their associates as to whether or not they are
11 aware of the quality control and quality assurance standards
12 as recommended by national -- US National DNA Advisory Board
13 and how practical it would be -- it would be for them to
14 follow those recommendations.

15 Q. Okay. Now, in terms of recommendations to such
16 countries like Columbia, would you make recommendations as to
17 the appropriate statistical interpretation if you had a cold
18 hit off of a databank?

19 A. Yes.

20 Q. Okay. All right. Now, lastly, with respect to the
21 professional activities, you've mentioned here that as of
22 2002 you're a member of the scientific working group on
23 microbial, m-i-c-r-o-b-i-a-l, forensic genetics.

24 What is that?

25 A. Well, this is a new community that has grown from the
26 current need. As you are aware, there are several biological
27 agents that a terrorist can use for terrorism activities. So
28 when a particular biological specimen is recovered from a

1 scene of terrorism, um, the first issue is can we identify
2 this -- this specific pathogen.

3 Q. Pathogen.

4 A. Yes. And whether or not that particular biological
5 specimen has any relevance; is it dangerous.

6 Q. Okay.

7 A. DNA typing is one of -- one of the most reliable ways
8 of quickly getting that task done, and it falls now under the
9 subject of microbial genetics. So a committee has been
10 created to discuss those issues, and I'm a member of that
11 working group as well because some of my research involved
12 using DNA variation to identify organisms and to do -- to
13 study their evolutionary -- evolutionary relationship.

14 THE COURT: So this particular field is to -- is to
15 attempt to identify organisms?

16 THE WITNESS: Organisms by DNA typing.

17 THE COURT: Okay.

18 Q. (BY MS. SCHUBERT) Now, you also indicate in here that
19 you have what's called editorial board memberships.

20 What is -- what does an editorial board membership
21 mean?

22 A. Well, the -- as you probably are aware, when we
23 complete scientific research we summarize our research
24 findings and send that document for publication. There are
25 organizations which deal with the publication which could be
26 individual entities like Nature Science, etcetera, or they
27 could be official publications of an existing scientific
28 organization like American Society of Human Genetics which

1 has their official publication as American Journal of Human
2 Genetics.

3 Q. Okay.

4 A. Now, these -- these publication authorities have an
5 editor who selects what to be publish and since the subjects
6 are so diverse, that a single editor cannot do the job, he or
7 she forms editorial board. The editorial board members look
8 over the review process. So it is sort of an honor to be
9 selected as editorial board member. Over my -- over the
10 years I have served as editorial board member of a number of
11 national as well as international journals.

12 Q. Okay. Now, in terms of publications -- scientific
13 publications, you are familiar with a concept called the peer
14 review process?

15 A. Correct.

16 Q. What does the peer review process entail?

17 A. Well, as a scientist when I have completed part of a
18 project and I found out that I may have discovered something
19 which is not in the literature, I would write that up and
20 send it to a journal. The journal, with the help of its
21 editorial board, would select a -- a set of reviewers,
22 sometimes one, sometimes three or four, who will look for the
23 novelty of the work, whether or not the work discusses
24 something which is not already done.

25 Second, it would look at the -- whether the
26 presentation of the work is good enough so that somebody else
27 may be able to reproduce the work. And third, whether or not
28 the work was done ethical.

1 Q. Okay.

2 A. Because there are some research that we are not
3 supposed to do in certain manners.

4 Q. Okay.

5 A. Um, once those -- once a manuscript goes -- passes
6 these review criteria the reviewers, the editorial board
7 members, would recommend the paper for publication. If it
8 goes through all of that process the publication would be
9 called a peer review publication.

10 Q. Okay. Now, would you -- would you agree that one of
11 the methods for discussion amongst scientists is in the whole
12 peer review publication process?

13 A. Correct.

14 Q. If there is -- if there is issues scientifically of
15 various issues in a particular field do you typically see
16 those born out in publications?

17 A. Yes.

18 Q. For instance, remember back in the days when the
19 product rule was the subject of discussion among forensic
20 scientists or other scientists? Does that make sense?

21 A. Yes.

22 Q. Okay. Were there -- were there several articles
23 dealing with the appropriateness of the product rule?

24 A. Was -- yes. There are a number of peer reviewed
25 publications that discuss those issues.

26 Q. Okay. Now, in terms of your work with being an editor
27 on some of these various journals, are there certain ones
28 listed here that deal with issues in the area of DNA

1 forensics?

2 A. Yes. For example, in -- from '86 through '91 I was a
3 member of the Editorial Board of American Journal of Physical
4 Anthropology and --

5 THE COURT: American Journal --

6 THE WITNESS: Journal of Physical Anthropology.

7 THE COURT: Okay.

8 THE WITNESS: There are a number of papers that
9 established population databases for genetic loci, l-o-c-i,
10 plural of Locus, that are used in DNA forensics.

11 Then from '92 through 1994 I was an associate editor of
12 American Journal of Human Genetics, which is a premiere
13 journal of official article of American Society of Human
14 Genetics, and that journal published enumerable number of
15 papers on the subject of statistical interpretation as well
16 as laboratory procedures for DNA typing in DNA forensics.

17 Then the American Journal of Human Biology, of which I
18 was an editorial board member until last month, there are a
19 number of papers that I reviewed and got published in -- in
20 subjects related to both statistics as well as population
21 databases for DNA forensics.

22 Q. (BY MS. SCHUBERT) Okay. Now, I don't know if you can
23 answer this or not, but how many articles would you estimate
24 that you have reviewed that deal with the area of DNA
25 forensics over the years?

26 A. This is a very hard question to answer accurately
27 because, um, I review more than -- I would say at least one
28 article per day, average. For example, in my briefcase now

1 there are six articles that are to be reviewed over the
2 holidays, and these days more than one-third of them are in
3 the area of DNA forensics.

4 Q. Okay.

5 A. So -- and I have been doing that for last fifteen
6 years.

7 Q. Now, have you -- have you reviewed articles that
8 involve statistical interpretations in DNA forensics?

9 A. Yes. A number of them -- a large number of them.

10 Q. Now, you mentioned also on your CV that you are -- you
11 belong to a number of professional societies?

12 A. Yes.

13 Q. Are there some that deal in particular with the area of
14 human population genetics?

15 A. Yes, a number of them. For example, Genetic Society of
16 America deals in population geneticists. The American -- I'm
17 a life member of the American Society of Human Genetics which
18 is obviously dealing with human population genetics. Then
19 I'm also a member of the American Society of Naturalists
20 which do include population genetics. Then Human Biology
21 Council, then the International Association of DNA
22 Fingerprinting.

23 Q. Doctor, these types of professional societies that you
24 belong to, are there typically conferences that you attend
25 that are held by various different organizations?

26 A. Yes. Each of these organizations have at least one
27 annual meeting per year. Um, I am a regular at the American
28 Society of Human Genetics, the -- the American Association of

1 Physical Anthropologies and Genetic Society of America.

2 These are three society meetings -- these are meetings like I
3 go to the church, like regular, I never miss those meetings.

4 Q. Now, with respect to the various meetings that you
5 attend that deal with the area of DNA forensics, is it -- is
6 it a fair statement to say that these types of meetings are
7 forums for discussions about whether there are issues or
8 controversies that exist in a particular field of DNA
9 forensics?

10 A. Yes.

11 Q. And at these different types of conferences do you
12 interact with other members of the forensic community such as
13 population geneticists, analysts, criminalists and have
14 regular discussions about whether or not there is, quote,
15 unquote, any type of controversy within a particular setting
16 of DNA forensics?

17 A. Yes. But I must qualify just for the benefit of the
18 Court so there is no misunderstanding, these three societies
19 that we mentioned, they are -- they have a much larger scope,
20 the DNA is not the sole thing that is discussed in those
21 meetings.

22 In the last annual meeting of the American Society of
23 Human Genetics, which was held in October in Baltimore, there
24 was one session on DNA forensics. So not for the full --
25 full four days we discussed DNA forensic issues.

26 Q. Okay.

27 A. But the subject matters that you are describing, they
28 are more thoroughly and more commonly discussed in forums of

1 similar nature. For example, there is at least one annual
2 meeting solely for the purpose of human identification
3 organized by Promega Corporation. I attend their US meetings
4 regularly. Then the American Academia of Forensic Sciences,
5 they have at least half of their sessions in the area of DNA
6 forensics. So the issues that you are mentioning are
7 discussed under those forums regularly, and I do attend them.

8 Q. Okay. Like, for instance, the Promega meeting, is that
9 a fairly well-attended meeting?

10 A. Yes. It is a fairly well-attended meeting and it is a
11 international one. Half of their attendees are from outside
12 of the United States.

13 Q. What types of experts are attending these types of --
14 like the Promega meetings?

15 A. Ranging from forensic analysts to the hair and fiber
16 experts, population geneticists or even anthropologists who
17 want to create databases or -- create databases.

18 Q. Okay. Now, at these particular meetings, say like a
19 Promega meeting, are there discussions at those meetings or
20 have there been where there's topics such as the statistical
21 interpretations in particular types of DNA cases?

22 A. Yes. There are discussions, but I wouldn't say that
23 the, um, discussions were motivated by controversies or
24 disagreements.

25 Q. Okay. Were there time periods, um, say, from 1992 till
26 say 1998 or so, where there were discussions at these types
27 of meetings about such things as the product rule and the
28 appropriateness of using the product rule?

1 A. Yes. I would say 1992 through 1996 the product -- the
2 validity of product rule was a major part of discussion in
3 these meetings.

4 Q. Okay. And was the validity of the product rule
5 something that was also well documented or the discussions
6 about the validity of the product rule well documented in the
7 scientific literature?

8 A. Yes.

9 Q. If you could -- I don't know if this is an appropriate
10 question -- estimate how many articles were written about the
11 validity of the product rule?

12 MR. LYNCH: Your Honor, are we going past expert
13 qualification here into the subject of testimony because I
14 would like to voir dire.

15 MS. SCHUBERT: That is fine. I can bring that back
16 later.

17 THE COURT: Okay.

18 MS. SCHUBERT: That is a fair objection.

19 Q. (BY MS. SCHUBERT) Fair to say though that with respect
20 to your attendance at these conferences you have had
21 interaction with other members of the -- not just the
22 forensic community but individuals that have expertise in the
23 area of population genetics?

24 A. Yes, I do.

25 Q. Now, you have also documented here on page 5 to 6 --
26 and I'm not going to go into any detail of these -- various
27 committee administration services that you have become
28 involved in dating back to 1983?

- 1 A. Yes.
- 2 Q. Okay. And then on page 6 of your CV here you have
- 3 listed out many different types of teaching activities that
- 4 you have done dating back to 1968, correct?
- 5 A. Yes.
- 6 Q. Now, can you just tell us without going into every
- 7 single class but the different types of classes that you have
- 8 taught over the years?
- 9 A. Well, basically, um, in early years, in late 60s and
- 10 early 70s, I use to give courses on purely statistical
- 11 methods as well as like statistical inference, statistical
- 12 methods of data analyst, probability theory.
- 13 Q. Probability theory?
- 14 A. Then from from late 70s, particularly after my
- 15 tenureship, when I became an associate professor and
- 16 university could not fire me anymore, um, then the -- the --
- 17 my teaching became more focused on my research areas of
- 18 contemporary interest. So I started teaching a course called
- 19 statistical genetics where part was related to statistical
- 20 issues in DNA forensics.
- 21 Q. Okay.
- 22 A. In Cincinnati I'm still doing that.
- 23 Q. Okay. You are teaching classes that deal with --
- 24 A. Right.
- 25 Q. -- statistical interpretations in DNA forensics?
- 26 A. Yes.
- 27 Q. Okay. Now, what level of students do you teach?
- 28 A. Uh, in Houston until -- until 199 -- 199 -- until 2001

1 we had only postgraduate students. So we were teaching
2 doctoral student and postdoctoral students.

3 In Cincinnati, where I am now, we have courses that
4 entertain bachelor students, also advanced bachelor students.
5 So in one of my courses, the statistical genetics one, the --
6 I'm expecting undergrad students -- undergraduate students
7 also, but most of my students are either predoctoral or
8 postdoctoral students.

9 Q. Okay. In the areas of teaching do activities focus on
10 statistical interpretations, population genetics?

11 A. Correct.

12 Q. Okay. Now, you mentioned here -- I'm not going to go
13 through this in tremendous detail, but you have a numerous
14 amount of grants you have been awarded over the years?

15 A. Yes.

16 THE COURT: We are starting a new area, let's take our
17 morning break. It's -- we can't see the clock. I have about
18 26 or 27 minutes after, it's almost half past. So we will
19 take a 15-minute break at this time, and we will return in
20 fifteen minutes.

21 THE WITNESS: Okay.

22 (Recess.)

23 ---oOo---

24

25

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1 ---o0o---

2 (Proceedings resumed after reporter switch
3 and a morning break.)

4 ---o0o---

5 THE COURT: All right. The record will show all
6 necessary parties are present, and you may continue your
7 examination.

8 MS. SCHUBERT: Thank you, Judge.

9 Q Dr. Chakraborty, I was going to move into the area of
10 various different grants you've gotten over the years, and I
11 want to just ask you on page 7 to 8 is it fair to say that
12 you've listed out many different types of grants you've
13 received over -- dating back to 1973?

14 A Yes.

15 Q Are there -- and I want to focus primarily on the area of
16 DNA and the forensic application of DNA. Have you received
17 grants over the years in that area?

18 A Yes, I did.

19 Q Okay. And you've got one listed here 1992 to 1994, one
20 that's listed as forensic applications of DNA data; is that
21 fair to say?

22 A Yes.

23 Q What did that entail?

24 A This is a grant that we got from National Institute of
25 Justice. At that time the technology of DNA typing were going
26 through a change from restriction fragment length
27 polymorphism --

28 Q We just call that RFLP?

1 A Yes. So the typing technology was changing from RFLP to
2 PCR based typing procedures. So we -- the objective of that
3 particular grant was to look at comparing analysis of
4 databases based on RFLP and PCR based technologies.

5 Q Okay.

6 THE COURT: What was the other technology? PCR?

7 THE WITNESS: PCR. Polymerase chain reaction. PCR.

8 THE COURT: Okay.

9 Q (By MS. SCHUBERT) It's fair to say, though, that with
10 respect to PCR technology that STRs is a method used -- using
11 the PCR process?

12 A Yes. STRs are the loci that are used -- that are typed
13 by using PCR based technology.

14 Q Okay. Now you've also mentioned here in 1996 to 1998
15 that you had a grant entitled validation of PCR based DNA
16 typing databases for forensic use?

17 A Correct.

18 Q What did that entail?

19 A So by 1996 PCR technology was more usually -- more widely
20 used in the forensic community. So more PCR based databases
21 were being produced. By the SWGDAM group.

22 (Reporter interrupted.)

23 THE WITNESS: SWGDAM, S-W-G-D-A-M, standing for
24 scientific working group of DNA analysis methods.

25 THE COURT: You should have been here for the last hour.

26 Q (By MS. SCHUBERT) Okay. So --

27 A So by that time the SWGDAM group was already generating
28 population databases based on the PCR based techniques. So as

1 a part of the SWGDAM work I wrote in the grant proposal to
2 analyze those databases to see whether the standard forensic
3 assumptions are appropriate for those databases.

4 Q Now you've also got two grants listed here, one in 1998
5 to 1999 and one in 1999 to 2000. That deals with the
6 validation of CODIS approved DNA markers?

7 A Correct.

8 Q Tell us what those dealt with.

9 A Well, the issue in 1977-1998, at least in court
10 proceedings, were where the forensic databases are based on
11 samples that are very poorly defined. Meaning they could be
12 European Americans from Houston or European Americans from
13 Miami Dade County or African Americans from Miami Dade County.
14 These are databases where the individual self identifies
15 themselves as members of that community. So in court
16 proceedings, at least, the issue is where allele frequencies
17 from such poorly described databases are not scientifically
18 accurate.

19 One way of testing that kind of assertion is to take
20 anthropologically well-defined populations and type the same
21 loci. Since in the context of our other ongoing research we
22 had access to such DNA samples, in those projects we typed the
23 CODIS approved loci in anthropologically defined populations to
24 show whether or not the forensic databases as described by
25 their population names are appropriate or not.

26 Q Okay. And when you talk in terms of the validation of
27 the CODIS approved DNA markers, what do you mean by the CODIS
28 approved DNA markers?

1 A Because as -- when CODIS started its operation in 1998,
2 the -- they had each loci that should be typed if that data is
3 to be uploaded into CODIS. So if it was RFLP technology they
4 were taking data on six probes, or loci. If it was a dark blot
5 technology they were taking the polymarker and DQ alpha loci.
6 And if it was a PCR based STR typing, they were taking the
7 13 STR loci.

8 Q You mentioned when you talked about DQ alpha, it was DQ
9 alpha and polymarker?

10 A DQ alpha and polymarker.

11 THE COURT: Once again, that's S as in Sam, T as in
12 Thomas --

13 MS. SCHUBERT: R as in Richard.

14 THE COURT: Okay.

15 MS. SCHUBERT: And for the purposes of this case I'm
16 assuming Mr. Lynch would stipulate that STRs were used in this
17 case, Judge.

18 Is that a fair assumption?

19 MR. LYNCH: We'll stipulate, yes.

20 Q (By MS. SCHUBERT) So now when we're talking about the
21 CODIS approved markers, what you're essentially talking about
22 is the transition from the older days of RFLP to DQ alpha
23 polymarker to the current technology of STR markers?

24 A Correct.

25 Q Okay. And the last grant I want to ask you about is you
26 have one that looks like it's a pending grant proposal for 2002
27 to 2004 dealing with forensic and DNA research development.

28 A Right.

1 Q Okay. What does that entail?

2 A Well, as I was saying before, we realized that for some
3 complex issues the 13 or 15 CODIS approved STR loci may not be
4 enough.

5 Q Okay.

6 A So as we did the work in 1992, these 13 loci came from
7 our initial position that from the genome wide battery of
8 polymorphic markers, these STR loci are good candidates for
9 forensic use.

10 Now we can ask the question is there -- are there other
11 loci in the genome that can be folded into forensic use --

12 Q Okay.

13 A -- for solving complex cases. Now the technology is --
14 as in the genome research is changing from PCR based STR typing
15 to what they call single nucleotide polymorphism studies. So
16 the question that I'm now asking is, is the SNP single
17 nucleotide polymorphism technology, can it be used in
18 forensics. What kind of platform would be needed, what kind of
19 validation work we need to do. So these are the issues that
20 I'm asking in my pending proposal now.

21 Q Now you've also listed here on page 8 that you have a
22 number of years of field experiences, and I want to
23 specifically direct your attention to your work since 1989. Is
24 it fair to say that you have directed various statistical
25 analyses of DNA typing for forensic use?

26 A Yes.

27 Q What types of -- starting in 1989, what types of
28 statistical analyses have you been involved in?

1 A Well, in the initial years from 1989 to 1994 this was
2 mainly the analysis and comparison of the databases being
3 prepared by the TWGDAM group, T-W-G-D-A-M, and then after that
4 the same group of laboratories were also denoting the PCR based
5 databases, and when the PCR based databases were being
6 discussion prepared not only laboratories from USA consulted
7 me, laboratories from Brazil, Canada, Spain, United Kingdom, as
8 well as Switzerland sent me the data for validation.

9 And the validation work consisted of several things.
10 First of all cross-examination of the data to see the internal
11 consistency of the data. Because there are some analyses that
12 can be done to see whether the laboratory during the time span
13 that did the work did the work consistently. We do that in
14 industry quality controls or quality control monitoring. Such
15 monitoring things can be done there with such forensic data
16 also. So these are not really testing any hypothesis or
17 anything like that. Looking for internal consistency of the
18 data.

19 And second is that is the product rule valid. Are the
20 loci independent. Those questions can be addressed --

21 (Reporter interrupted.)

22 THE WITNESS: The forensic databases are not really
23 ideally random samples. They're more convenient samples. The
24 individuals are not selected by a computer at random from the
25 whole country. Not that it is bad, but once it is done like
26 that then you cannot be 100 percent sure that the database does
27 not contain any relatives. Relative individuals. So there are
28 some checks that can be done to find out whether or not

1 databases contain relatives.

2 Q (By MS. SCHUBERT) Okay. Is it fair to say that with
3 respect to your field experience in forensic DNA typing,
4 statistical interpretations, that since 1989 until the present
5 that you have -- you have been involved in essentially
6 validating the appropriateness of the product rule as it
7 applies to DNA forensics?

8 MR. LYNCH: I'd object. One, it's leading. And two, I'm
9 not sure what she means by essentially validating.

10 MS. SCHUBERT: Well, I can rephrase it.

11 THE COURT: Let's try to do that.

12 Q (By MS. SCHUBERT) Is it fair to say, Doctor, that since
13 1989 you have been involved in the directing of statistical
14 analysis of DNA typing of human populations persisting in the
15 determination of the scientific validity of the product rule?

16 A Yes. But as I said before, my work did not really
17 restrict to validating the product rule only.

18 Q Okay.

19 A My statistical assessment of databases encompasses many
20 other things. Like whether or not the population name is
21 appropriate, whether or not the data is internally consistent,
22 there is -- to what extent relatives might be involved in the
23 specific databases, and how does that differ from one country
24 to the other or one database to the other.

25 Q Okay. Fair enough. Now in terms of -- in terms of your
26 work in the area of DNA forensics, have you been called upon as
27 a consultant to various forensic laboratories both in the
28 United States and as well as internationally?

1 A Yes.

2 Q How many -- first of all, if you know, approximately how
3 many forensic DNA laboratories are there in the U.S.?

4 A It's very difficult to give an exact count because of the
5 fact that there are a number of laboratories who do DNA work
6 but they are not approved as CODIS laboratories. But I have
7 consulted over 60 different laboratories in this country.

8 Q 60 or 16?

9 A Six-zero.

10 Q Okay. In the United States?

11 A Correct.

12 Q Have you consulted other forensics laboratories
13 internationally?

14 A Yes.

15 Q What types of countries are we talking about?

16 A Canada. The laboratories are all Canadian or Royal Mount
17 Police Laboratory, RCMP approved laboratories in Alberta,
18 British Columbia, in Halifax. At least three laboratories.

19 In Brazil, in Belo Horizonte B-E-L-O, Horizonte,
20 H-O-R-I-Z-O-N-T-E. Then in Curitiba --

21 Q That's a hard one.

22 A C-U-R-I-T-I-B-A, it's in southern Brazil. Then in
23 Uruguay in Montevideo. And then in Chile in Santiago. Then in
24 Columbia in Cali and Bogota. Then in India the laboratories
25 from Hyderabad, H-Y-D-E-R-A-B-A-D. And also in Calcutta,
26 Central Forensic Science Laboratory. In Japan, Tokyo and
27 Kyoto. In Germany, in Frankfurt laboratory and laboratory in
28 Bremen, B-R-E-M-E-N, in northern Germany. And then I've seen

1 reviewed some data from Peter Gills Laboratory in England.

2 Q Peter Gills?

3 A Peter Gills Laboratory in England, correct. I've
4 examined some data from an Australian laboratory in Melbourne.

5 I may have missed some, but these are essential things.

6 Q Okay. Now the labs that you're mentioning now, say the
7 U.S. labs, the ones that you said you've consulted over 60 U.S.
8 labs, are those laboratories that are connected with the CODIS
9 system?

10 A CODIS and our SWGDAM.

11 Q Meaning that they are connected to the felon databank run
12 by the State?

13 A Yes.

14 Q And how about internationally? Have you consulted -- the
15 labs you just mentioned internationally, are those laboratories
16 that are connected to whatever individual country has a felon
17 databank?

18 A Right. The laboratory in England, Peter Bills
19 Laboratory, has a felon database as well. But the validation
20 studies with respect to databases, those are for what they call
21 the population databases.

22 Q Okay. There's a difference between the population
23 database and the felon database?

24 A Felon database. In fact, in most -- in most of the
25 countries, like our own in the United States, the felon
26 database has restrictive use. Felon database can be -- access
27 to felon database can be made only under prescribed situations.
28 Felon database is to be used for an investigative purposes

1 alone. It is not open to any kind of research.

2 Q Okay.

3 A As a consequence, statistics are never provided based on
4 characteristics of felon database.

5 Q Okay. Let me go into that a little bit later after I
6 finish going through your c.v. also. Now you've listed here --
7 I know we talked a little about that you've done a large amount
8 of research in the area of DNA forensics, correct?

9 A Correct.

10 Q And specifically in the area of human population
11 genetics?

12 A Yes.

13 Q You've also written a lot of articles dealing with human
14 population genetics?

15 A Yes.

16 Q As it relates to forensics?

17 A Yes.

18 Q How many, if you could estimate, you've got here listed
19 starting on page -- page 13 you've got listed experience in
20 applications of genetics in basic sciences, law, and forensics.

21 A Correct.

22 Q Under that particular area on your c.v. do you detail
23 about, first of all, approximately how many papers and
24 scientific journals you've published in the area of DNA
25 forensics?

26 A Well, this section is more -- that's not really a list of
27 all of my research papers in the area of DNA forensics. These
28 are -- from page 13 to 18 are listed my experience in

1 applications of genetics in science, law, and forensics. So
2 these are like seminars that I gave at meetings or the reviews
3 that I did in the context of analysis of databases and things
4 like that. So there are 80 such items listed.

5 Q Okay. Can you just --

6 A Eight-zero.

7 Q I don't want you to necessarily go through all of them,
8 but in terms of your expertise in the area of forensic DNA, can
9 you tell us essentially what these -- what you detailed here?

10 A Yeah. Just to give an example, let me take the most
11 recent one. In the first week of November I was in Columbia,
12 Bogota. So in Columbia, Bogota there are six laboratories that
13 are being contemplated to be used for setting up something like
14 offender database. Now the six laboratories include some
15 laboratories in the southeastern part of the country where
16 there are individuals of Oriental mixture.

17 So the question asked to me is how big the offenders
18 database has to be before it is of any use in my applications
19 in Columbia. So I presented a talk called genotype and allele
20 sharing in databases, and do the observations meet the
21 expectations based on the analysis of the worldwide databases.
22 So that I could show to them even in populations of remote
23 origin the same expectations hold if you do the statistics
24 appropriately.

25 Q Okay. Now in addition to your talk in Columbia, in terms
26 of your expertise in forensic DNA you've indicated here
27 starting off as of 1974 to the present that you published over
28 120 papers dealing with the area of forensic DNA, correct?

1 A Correct.

2 Q Okay. And you've also testified as an expert in numerous
3 court proceedings?

4 A Right.

5 Q You also from 1989 to the present a consultant to the FBI
6 academy with respect to by statistical and population genetics
7 in DNA forensics?

8 A Yes.

9 Q Okay. And then you listed out here numbers of
10 conferences that you've attended dealing with DNA forensics,
11 correct?

12 A Yes.

13 Q Item number 36, you mention 1998 you're the moderator of
14 a session on CODIS experience with STRs. What did that
15 involve?

16 A That was probably in the year on 1998 when the CODIS just
17 started working officially. As a consequence we -- the CODIS
18 users asked the question that since some of the early data on
19 in CODIS was on RFLPs or how the situation has changed when the
20 STR loci are looked at in comparison to the RFLP data. So you
21 remember that for the RFLP loci we -- that the CODIS were using
22 somewhere between six to eight probes. For STR, although
23 initially it started with nine loci, now there are 13 loci. So
24 is there a major change in the experience of using the CODIS
25 data with RFLP loci versus STR loci.

26 THE COURT: Let me make sure I understand something. The
27 RFLP used how many loci?

28 THE WITNESS: Six to eight.

1 THE COURT: Okay. And then STR started with nine and
2 now --

3 THE WITNESS: Now it is 13 and soon it will be 15.

4 Q (By MS. SCHUBERT) Now you mentioned that there's a thing
5 called a CODIS users group?

6 A Correct.

7 Q Is that something that you're part of?

8 A Well, I'm not a CODIS user myself. But like the SWGDAM,
9 attending the SWGDAM meetings, I attend almost every CODIS user
10 group meeting as the lecturer or a faculty member.

11 Q Okay. So with respect to the CODIS user group meetings,
12 is it a fair statement that you interact with laboratory
13 directors or members of the CODIS DNA databanks, felon
14 databanks from across the country?

15 A Yes.

16 Q Now you've also indicated in here on your experience with
17 forensics that you have been called upon a number of times to
18 be a guest speaker on population genetics?

19 A Yes.

20 Q Was one of those was the National Commission on the
21 Future of DNA Evidence?

22 A Yes.

23 Q What is -- what was that?

24 A Well, as the national DNA Advisory Board was finishing
25 their charter, there was another committee created -- I think
26 again recommended by FBI director, but its sponsorship could
27 have been from other organizations also. It was called
28 National Commission of Future of DNA. Its mission was to look

1 at the entire science of recombinant DNA and to see what else
2 DNA forensics can utilize and where the future of DNA forensics
3 would be. So they asked several experts in the field to tell
4 their views on this subject.

5 Q Okay. And you were one of them?

6 A Correct.

7 Q And it appear from your c.v. that you have been asked
8 several times to come and talk to the CODIS users group,
9 correct?

10 A Yes.

11 Q Now you also have been called upon for several years to
12 be a consultant to the FBI?

13 A Yes.

14 Q And other government agencies dealing with forensic labs?

15 A Correct.

16 Q Now how many articles in addition to the 120 that deal
17 with specifically a forensic DNA analysis, how many articles in
18 total have you authored?

19 A Over 500.

20 Q Over 500. And I don't know if they're all here on your
21 c.v. or not, but do they -- is there a particular subject
22 matter that the majority of those articles deal with?

23 A Well, majority of my articles deal with how variation at
24 the level of DNA can be characterized. What are the mechanisms
25 to which such variations are produced and maintained in
26 population.

27 Q Okay.

28 A And then to look at how they can be used for different

1 purposes, which region of the genome -- which characteristics
2 of the region of the genome make the marker more useful in
3 certain context as opposed to others.

4 Q Okay. In terms of your experience in the area of
5 forensic DNA analysis, have you been called upon as an expert
6 to -- in California and other places to testify not just in the
7 area of statistical interpretations but also the DNA
8 methodology in a particular case?

9 A Yes, a number of times.

10 Q If you can, I don't know if you can estimate for us how
11 many times have you been called as an expert in forensic DNA
12 analysis.

13 A Well, I would answer that question two parts. I would
14 say -- I would first say that over the years from 1991 I have
15 reviewed more than 250 court cases. In not -- so I've opined
16 on in that many cases. But in not all cases I had to appear in
17 court.

18 Q Okay.

19 A So I would say that I have appeared in court and was
20 established as an expert in more than 80 cases. Eight-zero.

21 Q Okay. Now in terms of your expertise, have you testified
22 as an expert in terms of what is -- in admissibility hearings?

23 A Yes.

24 Q At what types of jurisdictions are we talking about have
25 you testified?

26 A In district courts, appellate courts, also federal
27 courts.

28 Q Okay. How many different states, if you know?

1 A A number. I think it's listed as the last item. Alaska,
2 Arizona, California, District of Columbia, Florida, Louisiana,
3 Massachusetts, Michigan, Minnesota, Mississippi, New Hampshire,
4 Nebraska, Nevada, New Mexico, Ohio, Oregon, Pennsylvania, South
5 Dakota, state of Washington, Texas, and in Canada Alberta and
6 British Columbia.

7 Q Okay. Now with respect to your testifying as an expert
8 in California, did you testify in the People versus Soto case?

9 A Yes.

10 Q Did you also testify in the People versus Vanegas case?

11 A Yes.

12 Q Then finally, Doctor, with respect to your
13 qualifications, People's Exhibit 20, just so I don't have to go
14 through every single page, is it fair to say that pages 1
15 through -- I'm not sure what the last page on that exhibit is,
16 63, is a fair representation of your both educational
17 background as well as professional experience since the time
18 that you have gone to school?

19 A Yes.

20 Q Okay.

21 MS. SCHUBERT: At this time I would offer Dr. Chakraborty
22 as an expert in the area of DNA analysis, including the area of
23 population genetics.

24 THE COURT: All right. Mr. Lynch.

25 MR. LYNCH: Thank you, your Honor.

26 ///

27 ///

28 VOIR DIRE EXAMINATION

1 BY DAVID LYNCH, Assistant Public Defender, Counsel for the
2 Defendant:

3 Q We'll get into your background a little bit. We talked a
4 lot about databases in general. Would it be fair to say that
5 there are certainly two kinds of database, a population
6 database and an offender database?

7 A Yes.

8 Q When you're dealing with issues with a population
9 database, generally you're dealing with issues to discern
10 whether or not there's any substructure, whether or not you're
11 in equilibrium, whether or not it's valid for using the product
12 rule, correct?

13 A Yes.

14 Q And sometimes you're also looking at whether or not the
15 method that's used to generate the database have been correctly
16 performed, correct?

17 A Yes.

18 Q Okay. But those issues are different and separate to the
19 issues that arise with an offender database, correct?

20 MS. SCHUBERT: Objection. Relevance at this point.

21 MR. LYNCH: Your Honor, I'm just clarifying the terms so
22 when we go through the voir dire we'll understand what is more
23 significant and what is less significant.

24 THE COURT: I'll permit it.

25 MR. LYNCH: Thank you.

26 Q So the issues that -- the issues that you deal with when
27 you look at an offender database are different issues to the
28 ones that you look at when you look at the population database,

1 correct?

2 A No, there are -- some issues are the same.

3 Q Okay. What issues are the same?

4 A For example, the typing technology.

5 Q Okay. But if --

6 A The proficiency testing of the analysts, the quality
7 control and quality assurance issues, these are the same for
8 offenders and population database.

9 Q Okay. But when we're talking about the statistics, when
10 you deal with statistical tests and analyses of a population
11 database, those statistical tests and analyses are directed at
12 discerning whether or not the population is in equilibrium,
13 correct?

14 A Yes.

15 Q The statistics use from an offender database are usually
16 those that are related to whether or not -- or how significant
17 the match is, correct?

18 A Actually, there's no statistics done from the offenders
19 database.

20 Q Okay. There's no statistics generated from the database,
21 but when you get a hit from an offender database there are
22 statistics that are calculated and presented in court as to the
23 significance -- or the random match probability, the
24 significance --

25 A Using population database.

26 Q Okay. My question is that the analyses that you do on
27 population databases are different to the analysis that ends up
28 getting presented in court, which is basically a summary --

1 MS. SCHUBERT: I'm going to object at this point as to
2 relevance as to voir dire, Judge.

3 MR. LYNCH: I'm trying to clarify the terms, Judge.

4 THE COURT: I guess I'll permit that question, but I
5 think you're going to have to restate it, and it's not
6 completely clear to me.

7 MR. LYNCH: I think we are getting complicated here
8 moving into the substance, so I will just get to the voir dire
9 questions at this time, your Honor.

10 THE COURT: All right. I think that's a good plan.

11 Q (By MR. LYNCH) So you indicated that you first got your
12 first training at the Indian Statistical Institute?

13 A Correct.

14 Q Is that a university?

15 A That's not a regular university, but it's a degree
16 granting organization.

17 Q What do you mean by it's not a regular university?

18 A It's -- for example, analog in this country would be
19 Massachusetts Institute of Technology, MIT. They give masters
20 and Ph.D. degrees, but it's not a university. It's affiliated
21 with Harvard University.

22 Q Okay.

23 A California Institute of Technology. Indian Statistical
24 Institute is an institute of similar stature, if not higher.

25 Q Okay. Well, you say it's affiliated with something.
26 What is the Indian Statistical Institute affiliated with?

27 A It's affiliated with University of Calcutta.

28 Q And you got your statistics -- bachelors in statistics,

1 correct?

2 A Yes.

3 Q You got a masters in statistics, and I believe your
4 resume mentions mathematical genetics.

5 A Correct.

6 Q What exactly is mathematical genetics?

7 A Population genetics is a part of mathematical genetics.
8 The mathematical genetics is a little bit more broader in the
9 sense it also deals with the mechanistic explanation, modelling
10 of mechanic -- genetic mechanisms, likely combinations,
11 mutation, and things like that.

12 Q So did you study human populations at that point in time?

13 A Yes.

14 Q Okay.

15 A All of my laboratory work dealt with human population.

16 Q Did you study -- did you do experiments on human
17 populations?

18 A Yes.

19 Q Did you study nonhuman populations?

20 A To some extent, yes.

21 Q Okay. And why would you study nonhuman populations?

22 A To look at some evolutionary issues, those that are more
23 difficult to answer with human populations. For example, we
24 talk about a phenomenon like effect of finite population. Over
25 time the changes, genetic changes in a finite population cannot
26 be truly done in a human population because obviously my next
27 generation will not be directly observed by me. But with
28 organisms like fish or house flies, those things can be done.

1 So during 1980s, in fact, we did some experiments with
2 fish populations to study the effect of finite population on
3 genetic changes.

4 Q Would it be fair to say --

5 THE COURT: Just a second. To study the effects of --

6 THE WITNESS: Finite population.

7 THE COURT: On?

8 THE WITNESS: On genetic changes.

9 THE COURT: On genetic changes. Thank you.

10 Q (By MR. LYNCH) Would it be fair to a that a lot of
11 statistical information comes from the study of nonhuman
12 populations such as flies and fishes?

13 A Some, yes. I wouldn't say -- I won't say a lot. Some
14 do, yes.

15 Q Well, the concept of the product rule was developed from
16 studies on nonhuman populations, correct?

17 MS. SCHUBERT: I'm going to object to at this point to
18 relevance to voir dire, Judge.

19 THE COURT: What's the relevance?

20 MR. LYNCH: I'm just establishing the basic stuff before
21 I go into --

22 THE COURT: What?

23 MR. LYNCH: I'm just establishing some basic facts before
24 we go -- he's telling us he's a population geneticist as
25 opposed to human population, and there's differences and we
26 need to know what those are in order to understand your --

27 THE COURT: I don't sense your question is doing that.

28 MR. LYNCH: Let me ask another question then, your Honor.

1 Q What is the difference between a human population
2 geneticist and a population geneticist?

3 A The differences are subtle in the sense that there are
4 some issues in human population genetics that are very
5 difficult to have good idea on if you are trending population
6 genetics alone.

7 Q Okay. What would those issues be? Would they be
8 relevant to --

9 A For example, since we can talk to our study subjects, we
10 can distinguish the study subjects in human much better than if
11 you're studying drosophila, D-R-O-S-O-P-H-I-L-L-A -- or L-A.
12 Single A. For example, suppose I look at individuals in this
13 room. Without even any knowledge of sociology or anthropology
14 we can immediately well, the individuals presented in this room
15 do not necessarily come from a single homogenous population.

16 But if you were looking at fruit flies, collecting them
17 from a bottle in which you put squashed banana so that every
18 hungry fly will get into it, in the morning when you got the
19 fifty flies you do not know whether it was the whole hungry
20 family that came in or fifty other different unrelated flies
21 came in.

22 Q Okay.

23 A So that distinguishing in human you can make very easily
24 without even studying the underlying subject. But in other
25 population genetics you never ask that question.

26 Q Well, summarizing then, you can get different information
27 from doing tests on humans than you can do on fruit flies?

28 A Right.

1 Q Okay.

2 A So if you were trained as a population geneticist in
3 general you may not be looking for such intricate differences,
4 which one has to more be more worried about in the human
5 population genetic.

6 Q When we're talking about the study or the application of
7 the product rule, those subtle differences aren't important
8 once we've got a population database that we've determined to
9 be accurate and reliable, whether your background is in human
10 genetics or just population genetics you're still going to be
11 able to apply the product rule and draw inferences and do work
12 on that, correct?

13 MS. SCHUBERT: I'm going to object again as to beyond the
14 scope of voir dire, Judge.

15 THE COURT: It sounds like it's beyond the scope, as well
16 as almost unintelligible.

17 Q (By MR. LYNCH) Well, you got your masters in
18 mathematical genetics. Did you do any DNA work at that point
19 in time?

20 A I was -- DNA was discovered by then. DNA double helix
21 was discovered in 1953. In 1971 there was -- I don't think
22 there was any paper on population genetics with DNA.

23 Q So you did none in your masters?

24 A We knew what DNA is about, but DNA research did not start
25 until 1978 when Dr. Southern discovered how to do the work with
26 DNA population level.

27 Q What about your Ph.D.? Did you do any DNA work in your
28 Ph.D.?

1 A No. On my Ph.D. degree was also predated DNA laboratory
2 work. My Ph.D. was done in 1971. 1978, it was the time when
3 we first came to know when we can work with DNA at a population
4 level.

5 Q Okay. Now your first full time appointment in the U.S.
6 was with the University of Texas in 1973?

7 A Correct.

8 Q You started off as a student, then became a professor?

9 A Not a student. I was -- I post-doctorate fellow for
10 six weeks, after which I became an assistant professor. I
11 joined in February of 1973 and made an assistant professor in
12 April 1.

13 THE COURT: You were a post-doctorate fellow?

14 THE WITNESS: Post-doctorate fellow, yes.

15 THE COURT: Okay.

16 Q (By MR. LYNCH) Since then until your latest trip to
17 Cincinnati, you've been working at two places, at the
18 University of Texas, fair to say, the Demographic and
19 Population Genetic Center and the School of Public Health?

20 A Well, it's somewhat a misinterpretation. In 1973 our
21 center was the called Center for the Demographic and Population
22 Genetics. We were part of the graduate school of our medical
23 sciences of the University of Texas Health Science Center.

24 In 19 -- I believe it was '86 or '87 there was a change
25 in the administration of the University of Texas Health Science
26 Center. Faculty members could not be -- faculty members had to
27 be associated with a professional school. Graduate school of
28 our medical science was a teaching school. So our center was

1 assigned to School of Public Health. Our academic appointment
2 moved to School of Public Health.

3 And then at the retirement of our founding director, the
4 name of the center also changed. It became Human Genetic
5 Center. So it's not really two appointments. It's the same
6 appointment changed its name -- affiliation changed with time.

7 Q And besides teaching were you doing any research during
8 the period of 1973 to 2001?

9 A Yes.

10 Q Okay. Your research began focused on Indian populations;
11 is that correct?

12 A Yes. In India my research was on Indian population.

13 Q Started off with surnames, diseases, print ridges, things
14 like that?

15 A Yes. Including dermatoglyphics. The fingerprints.

16 Q When did you first start doing studies relating to human
17 DNA?

18 A Human DNA?

19 Q Yes.

20 A Or human genetic markers? Which?

21 Q Human DNA.

22 A 1976.

23 Q Okay. And when did you first start doing research or
24 investigation, if any, relating to human DNA for identification
25 purposes as opposed to health or medical purposes?

26 A I would say my first paper on use of human DNA for
27 identification was in 1984. Soon after Alex Jeffrey's
28 discovery -- J-E-F-F-R-E-Y -- of DNA fingerprinting.

1 Q Would you say your focus for research during the time
2 that you were in Texas, University of Texas, was more on
3 population genetics relating to study of disease or population
4 genetics relating to forensics?

5 THE COURT: Let me see if I understand something. He was
6 at the University of Texas for a long time, was he not?

7 MR. LYNCH: Yeah. '73 to 2001.

8 THE COURT: Well, I don't know if that's a question he
9 can answer.

10 Can you describe almost 30 years as being primarily on
11 one subject?

12 THE WITNESS: Absolutely not.

13 Q (By MR. LYNCH) Okay.

14 A I was -- as I told, that my research has three threads in
15 it all intertwined. One is what is the extent of genetic
16 variation between individuals within as well as across
17 populations. And second is how can we use that information for
18 practical purposes. One purpose for which I -- in which I
19 spent my major time is discovery for genes underlying complex
20 diseases. And second application is DNA forensics,
21 identification, parentage testing, risk assessment.

22 Q Okay. You said you spent the majority of your time
23 relating to disease rather than identification; is that fair to
24 say?

25 A Yes.

26 Q How much percentage of your time do you spent on
27 identification?

28 A That's to some extent reflected in a number of

1 publications. If 120 of my 500-plus papers are in DNA
2 forensics, I'm saying -- I would say a quarter percent,
3 25 percent of my time is on DNA forensics and related questions
4 and 75 percent times on other issues.

5 Q Okay. At your current position is your research into
6 identification roles of DNA part of your job?

7 A Yes. That's one of my active research projects.

8 Q Okay. Are you a member of National Academy of Science?

9 A No.

10 Q Are you a member of National Research Council?

11 A Actually there is no membership in National Research
12 Council. National Research Council is an arm of the National
13 Academy of Science. The council members are selected or based
14 on the specific issues. No, I have not been a member of
15 National Research Council related to DNA forensics. But I was
16 a member of the National Research Council committee of effect
17 of radiation on health.

18 Q Okay. But for DNA purposes you weren't selected to be to
19 National Research Council --

20 A No.

21 Q -- that promulgated the two books known as NRC-1 and
22 NRC-2?

23 A No, I was not a committee member in either of them.

24 Q Have you ever done STR testing for case work?

25 A Case work?

26 Q For criminal cases?

27 A Case work, no.

28 Q Have you ever done work in a forensic criminal lab?

1 A What do you mean by work? You have to define.

2 Q Well, besides observing, have you ever actually been in
3 there performing DNA testing in a criminal lab a district
4 attorney's lab, a county lab, the FBI lab?

5 A No.

6 Q Have you ever followed a case through inception to the
7 end as an observer in DNA forensics?

8 A Yes, I have done that.

9 Q That was the case I think you talked about where you did
10 some investigation. We'll get into that later.

11 Have you ever done research for a forensic lab? Have
12 they ever asked you to do research on things that they are
13 discovering happening in their lab?

14 A Yes.

15 Q What kind of research have you done?

16 A Well, for example, as I said, I validated but in a broad
17 sense the databases of the Orange County laboratory from RFLP
18 days, and then similarly for a Metro-Dade County I have
19 validated their databases. Suffolk County, New York, I've done
20 that. And then combined CODIS databases, population databases.

21 Q Now you indicated when you were talking to the district
22 attorney that you went -- your first foray into this field of
23 forensic DNA was with parentage testing; is that correct?

24 A Correct.

25 Q Now parentage testing with DNA is different to
26 identification testing where you're seeing if somebody is a
27 match, correct?

28 A I don't see -- understand your question. What do you

1 mean by different?

2 Q Well, let me try it -- if you're testing a child or
3 you're trying to see if I'm the father, you test me and the
4 child and you're not expecting an exact match, DNA match,
5 correct?

6 A No.

7 Q The way you investigate whether somebody is the father or
8 not is you look at the occurrence of the matching alleles and
9 the number of nonmatching alleles and you do some statistical
10 analysis of that to determine how likely I am the father,
11 correct?

12 A Yes.

13 Q Whereas if we're talking about identification cases, you
14 would compare me to maybe some evidence, and unless there was a
15 complete match at all the alleles you wouldn't do any
16 statistics, correct?

17 A It depends on upon the question you're going to answer.

18 Q What if I'm asking if I was the source of the evidence
19 material? You would expect before you did any statistics that
20 there would be a match at all the loci?

21 A Well, the issue might come up whether the mismatch that
22 you're finding is due to your faulty typing procedure.

23 Q Okay. But typing procedures aside, just on the
24 statistics we're talking a different manner of analysis between
25 parentage testing and identification testing, correct?

26 A Yes. You ask different questions, you use different
27 statistics, you get different answers. But the principles are
28 the same. Principles meaning these genetic markers follow some

1 rules, and the same rules are applied in answering these
2 different questions.

3 Q Except --

4 A But the question in forensic identity testing is more
5 often different from questions asked in parentage testing. As
6 a consequence, the different formulae, different methods are
7 used.

8 Q Okay.

9 A But the principles are the same.

10 Q Now you said were you a member of TWGDAM as a faculty
11 member when you were talking to the district attorney. What
12 does that mean, you're a faculty member of TWGDAM?

13 A TWGDAM is a community is a group of forensic analysts or
14 laboratory -- directors of laboratories who are doing on a
15 day-in-day-out basis of forensics related work. Since I do not
16 belong to any such laboratory, I'm not a formal TWGDAM member.
17 But the issues discussed in the TWGDAM meeting and the agenda
18 of their meeting, namely the continuing education part,
19 involves members who go and lecture in front of them or listen
20 to their issues and advises them. And I have been doing that
21 to them since 1989.

22 Q Would it be fair to say that TWGDAM focuses generally on
23 the methods used, the forensic typing methods more than the
24 statistics?

25 A Not necessarily.

26 Q Okay.

27 A There were times when all the four meetings of the year
28 were on statistical issues.

1 Q Okay. But the majority of the issues relate to quality
2 control methods, appropriate methods to be using and the
3 physical testing of the DNA, correct?

4 A Most of the time, yes.

5 Q And have you -- you've been an invited expert
6 occasionally. Have you ever attended any meetings where the
7 correct procedures to be used in a cold hit case, criminal
8 case, have been concerned?

9 A I didn't understand your question. You had too many
10 things. One thing that I didn't understand is what do you mean
11 by correct?

12 Q Okay. Well, let me just clarify what I'm -- when I'm
13 talking about cold hits --

14 A Yes.

15 Q -- I use that term to mean an example where somebody
16 previously unsuspected is located because the evidence is
17 searched, the evidence profile is searched through a massive
18 database of offenders.

19 MS. SCHUBERT: I'm going to object at this point on
20 relevance.

21 MR. LYNCH: That's a cold hit. I'm asking him his
22 expertise on that.

23 THE WITNESS: That's your --

24 THE COURT: I'll permit that question.

25 MR. LYNCH: Okay.

26 THE WITNESS: That's your definition of cold hit?

27 Q (By MR. LYNCH) Yes. So when I ask my question, that's
28 what I mean by cold hit.

1 A I don't think there is any database of unsuspected people
2 that is searched for cold hit.

3 Q I'm sorry?

4 A I don't think there is an unsuspected people's database
5 that is searched for cold hit.

6 Q Okay. You're familiar with database searches of offender
7 databases, correct?

8 A Yes. Offenders database by definition is a database of
9 persons with previous criminal history.

10 Q Okay. Now when a database search is done, is it a
11 prerequisite to your knowledge that the police must have some
12 indication as to who is involved in the crime?

13 MS. SCHUBERT: I'm going to object at this point to
14 relevance as to expertise.

15 THE COURT: Sustained.

16 MR. LYNCH: We were just trying to establish what the
17 meaning of cold hit was, and he objected to my definition so
18 before we proceeded I needed to establish that.

19 THE COURT: I'm going to sustain the objection.

20 MR. LYNCH: Okay.

21 Q We were talking about TWGDAM meetings and your
22 presentations. Have you done any presentations or been present
23 at any TWGDAM meetings when the topic of the appropriate
24 statistics to be used in a cold hit case, a case that has
25 result from a database search of a convicted offender database
26 been involved?

27 A Yes.

28 Q Okay. And how many times has that discussion arisen?

1 A Well, I -- it's difficult to say how many times, but I
2 would say that during 1998, 1999 there were at least three or
3 four meetings in which statistics related to database search
4 originating cases were discussed. And then apart from TWGDAM,
5 as I was saying that I was a member of the national DNA
6 Advisory Board, the database search issues and related
7 statistical issues were discussed in DAB meetings as well. I
8 am -- I was the subcommittee member who had to write the draft
9 DAB recommendation for this part of the DAB recommendation.

10 Q Would that be the section in -- I'm going to show the
11 witness PT -- is that a V? PT-V. That's an article that was I
12 believe in --

13 A Forensic Science Communication, yes. This part of the
14 DAB recommendation was published in Forensic, yes.

15 Q And you're saying you wrote the section that's headed
16 database searches?

17 A Yes, together with three of the subcommittee members I
18 wrote that part.

19 Q And what kind of -- I'll get to that later.

20 You're saying that and the TWGDAM meetings, you also
21 mentioned a New York subcommittee with the district attorney
22 that there were discussions about getting cold hits and how
23 they were presented in court?

24 A Correct.

25 Q What research did you do into that when you were
26 discussing that with the New York subcommittee?

27 A I didn't understand, meaning a research.

28 Q Well, did you do any research before talking with the

1 subcommittee about your opinions on cold hits and how to
2 present them in court?

3 A I would say yes, because the questions that we thought
4 relevant in the cold hit cases are such that they have
5 similarities with some of the questions that I asked in the
6 context of disease gene identification or risk assessment as
7 well.

8 Q So you didn't -- you're saying you didn't do any specific
9 research on cold hit cases for your discussions with the New
10 York subcommittee, you just relied on prior knowledge?

11 THE COURT: Well, just a second. I don't think it's
12 reasonable to focus and say whether he did some specific
13 research for the purpose of talking to one group. The issue
14 would be to me whether he did the research, whether it was
15 specifically for that group or for another group or for an
16 article or whatever. So I think that's a question that could
17 be misunderstood and misleading.

18 MR. LYNCH: Okay. I'll reask it.

19 Q Not just limiting you to the New York subcommittee, but
20 when you've had these discussion at TWGDAM and in preparing
21 your article that we just mentioned, pretrial V, did you do any
22 specific research or investigation before you made your
23 recommendations in each of those proceedings?

24 A Yes, I did.

25 Q Okay. What specific investigation did you do?

26 A (No response.)

27 Q I mean did you rely on your existing knowledge or did you
28 go out and do experiments and research?

1 A I don't understand your question, because what kind of
2 experiment are you thinking about for getting answer for cold
3 hit cases?

4 Q Well, I guess my question is did you do any research.

5 A There's no experiment to be done. Here is a question
6 that has to be addressed. We ask the community of TWGDAM or
7 the bioTWG (phonetic) group in New York as to what do they
8 consider are relevant questions that can be asked in a cold hit
9 cases. Because I'm not sitting in the jury box, I'm not
10 sitting in the honor chair there to decide what would be a
11 relevant question for the court. So we ask them what are the
12 questions, and then we said that this is how a cold hit case is
13 generated, here are the principles which are -- some of the
14 principles are much older than my grandfather so you don't need
15 to do any experiments to validate them. So you use those
16 principles and give the answer.

17 Q Okay. Let me try and clarify. I'm not sure from your
18 answer, are you saying that you went to TWGDAM and they told
19 you what they considered the relevant questions were and then
20 you answered them?

21 A No. I -- if I gave the particular description of what a
22 cold hit case is, I can enumerate a number of questions.
23 Multiple questions can be asked.

24 Q I understand. My question is, did TWGDAM tell you the
25 questions they were interested in and you responded with your
26 information on how to deal with those questions?

27 A Right.

28 Q Or did you come up with the questions?

1 A When I lecture on this topic, as I did since 1998, I said
2 a cold hit case is described as follows, I give a description.
3 And once it is described in this fashion, you can ask a number
4 of alternative questions. And the answer for the first
5 question needs to be done this way, the answer for the second
6 question is this way, third question this way, and so on. And
7 it is up to the community to define the relevant questions and
8 take the recommended answer.

9 Q Okay. So when you were dealing with TWGDAM and you were
10 dealing with writing this article and talking with the New York
11 subcommittee you were not coming forth yourself with relevant
12 questions, you were relying on them to give you the questions
13 and then you would do your best to answer, correct?

14 A Well, that's again not a correct representation of how
15 these proceedings are written or went. The -- as in other some
16 other forensic case work depending upon the scenario different
17 questions can be asked. It is up to the forensic analyst to
18 define what the relevant question would be in the context of
19 his or her case. It is up to the court to decide well, what
20 relevant questions can be asked -- or answered.

21 As a scientist, my objective was to show that a cold hit
22 case could be modelled as follows, and once it is modeled in
23 the following fashion then a number of alternative questions
24 can be asked. And for each of these questions here are the
25 principles, some of which are age-old verified, that can be
26 used to get such-and-such answer. So if you change the
27 question, the answer is different.

28 Now someone does not distinguish between the different

1 questions, look at the different answers, they might call it a
2 controversy.

3 Q Well, here's my question. Have you done any
4 investigation or research into what statisticians and
5 mathematicians in the scientific community feel are the
6 relevant questions in a database or cold hit case?

7 A Yes, I have done that research.

8 Q Okay. How did you undertake that research?

9 A Literature search, reading the articles.

10 Q Okay. So --

11 A Talking to fellows in scientific meetings.

12 Q Okay. So both anecdotal in the sense that you would talk
13 to people at meetings, and I guess more objective in the sense
14 that you would read articles that have been published, correct?

15 A Yes.

16 Q Okay. What articles have you read discussing the correct
17 or appropriate issues to be resolved in a cold hit case?

18 A Again, your question is rather complicated.

19 Q Okay. Well, let me ask you some more specific ones.

20 A If -- maybe my answer would be different than saying what
21 articles did you read because not everything that's printed is
22 correct.

23 Q Okay. Well, start at the appropriate end of this stack.

24 Did you read the article by Anders Stockmar -- I can
25 spell these later -- Likelihood Ratios for Evaluating DNA
26 Evidence When the Suspect Is Found Through a Database Search?
27 That's PT-W.

28 A I have not written any -- read any article numbered PT-W

1 but --

2 Q I'm sorry, PT-W is the exhibit number.

3 A If the article is published in -- a periodical article
4 published in Biometrics in 1999, yes, I've read that one.

5 Q You've read that one? And what about -- this is PT-Y --
6 by Balding and Donnelly, Evaluating DNA Profile Evidence When
7 the Suspect Is Identified Through a Database Search?

8 A Is it a Journal of Forensic Science paper.

9 Q I believe it is?

10 A Yes, I've read that.

11 Q May as well get back to the Stockmar.

12 Did you follow up on the Stockmar article and read the
13 comment that was later published and then Stockmar's reply to
14 the comment?

15 A Yes.

16 MS. SCHUBERT: I'm sorry, I don't think I have a copy of
17 that.

18 MR. LYNCH: That's PT-DD. I guess we're in double
19 letters now.

20 Q Did you read the book by Evett and Weir, specifically
21 chapter nine which talks about presenting evidence in a cold
22 hit case? You did you read that?

23 A Yes.

24 Q You read chapter nine?

25 A Yes.

26 Q That's PT-Z.

27 THE COURT: I think we've reached the 12 o'clock hour, so
28 we'll take our recess at this time. We'll be in recess until

1 1:30 this afternoon, and we'll continue at that time.

2 ---o0o---

3 (Proceedings recessed to 1:30 p.m., this department.)

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1 ---o0o---

2 (Proceedings resumed after reporter switch
3 and a morning break.)

4 ---o0o---

5 THE COURT: All right. The record will show all
6 necessary parties are present, and you may continue your
7 examination.

8 MS. SCHUBERT: Thank you, Judge.

9 Q Dr. Chakraborty, I was going to move into the area of
10 various different grants you've gotten over the years, and I
11 want to just ask you on page 7 to 8 is it fair to say that
12 you've listed out many different types of grants you've
13 received over -- dating back to 1973?

14 A Yes.

15 Q Are there -- and I want to focus primarily on the area of
16 DNA and the forensic application of DNA. Have you received
17 grants over the years in that area?

18 A Yes, I did.

19 Q Okay. And you've got one listed here 1992 to 1994, one
20 that's listed as forensic applications of DNA data; is that
21 fair to say?

22 A Yes.

23 Q What did that entail?

24 A This is a grant that we got from National Institute of
25 Justice. At that time the technology of DNA typing were going
26 through a change from restriction fragment length
27 polymorphism --

28 Q We just call that RFLP?

1 A Yes. So the typing technology was changing from RFLP to
2 PCR based typing procedures. So we -- the objective of that
3 particular grant was to look at comparing analysis of
4 databases based on RFLP and PCR based technologies.

5 Q Okay.

6 THE COURT: What was the other technology? PCR?

7 THE WITNESS: PCR. Polymerase chain reaction. PCR.

8 THE COURT: Okay.

9 Q (By MS. SCHUBERT) It's fair to say, though, that with
10 respect to PCR technology that STRs is a method used -- using
11 the PCR process?

12 A Yes. STRs are the loci that are used -- that are typed
13 by using PCR based technology.

14 Q Okay. Now you've also mentioned here in 1996 to 1998
15 that you had a grant entitled validation of PCR based DNA
16 typing databases for forensic use?

17 A Correct.

18 Q What did that entail?

19 A So by 1996 PCR technology was more usually -- more widely
20 used in the forensic community. So more PCR based databases
21 were being produced. By the SWGDAM group.

22 (Reporter interrupted.)

23 THE WITNESS: SWGDAM, S-W-G-D-A-M, standing for
24 scientific working group of DNA analysis methods.

25 THE COURT: You should have been here for the last hour.

26 Q (By MS. SCHUBERT) Okay. So --

27 A So by that time the SWGDAM group was already generating
28 population databases based on the PCR based techniques. So as

1 a part of the SWGDAM work I wrote in the grant proposal to
2 analyze those databases to see whether the standard forensic
3 assumptions are appropriate for those databases.

4 Q Now you've also got two grants listed here, one in 1998
5 to 1999 and one in 1999 to 2000. That deals with the
6 validation of CODIS approved DNA markers?

7 A Correct.

8 Q Tell us what those dealt with.

9 A Well, the issue in 1977-1998, at least in court
10 proceedings, were where the forensic databases are based on
11 samples that are very poorly defined. Meaning they could be
12 European Americans from Houston or European Americans from
13 Miami Dade County or African Americans from Miami Dade County.
14 These are databases where the individual self identifies
15 themselves as members of that community. So in court
16 proceedings, at least, the issue is where allele frequencies
17 from such poorly described databases are not scientifically
18 accurate.

19 One way of testing that kind of assertion is to take
20 anthropologically well-defined populations and type the same
21 loci. Since in the context of our other ongoing research we
22 had access to such DNA samples, in those projects we typed the
23 CODIS approved loci in anthropologically defined populations to
24 show whether or not the forensic databases as described by
25 their population names are appropriate or not.

26 Q Okay. And when you talk in terms of the validation of
27 the CODIS approved DNA markers, what do you mean by the CODIS
28 approved DNA markers?

1 A Because as -- when CODIS started its operation in 1998,
2 the -- they had each loci that should be typed if that data is
3 to be uploaded into CODIS. So if it was RFLP technology they
4 were taking data on six probes, or loci. If it was a dark blot
5 technology they were taking the polymarker and DQ alpha loci.
6 And if it was a PCR based STR typing, they were taking the
7 13 STR loci.

8 Q You mentioned when you talked about DQ alpha, it was DQ
9 alpha and polymarker?

10 A DQ alpha and polymarker.

11 THE COURT: Once again, that's S as in Sam, T as in
12 Thomas --

13 MS. SCHUBERT: R as in Richard.

14 THE COURT: Okay.

15 MS. SCHUBERT: And for the purposes of this case I'm
16 assuming Mr. Lynch would stipulate that STRs were used in this
17 case, Judge.

18 Is that a fair assumption?

19 MR. LYNCH: We'll stipulate, yes.

20 Q (By MS. SCHUBERT) So now when we're talking about the
21 CODIS approved markers, what you're essentially talking about
22 is the transition from the older days of RFLP to DQ alpha
23 polymarker to the current technology of STR markers?

24 A Correct.

25 Q Okay. And the last grant I want to ask you about is you
26 have one that looks like it's a pending grant proposal for 2002
27 to 2004 dealing with forensic and DNA research development.

28 A Right.

1 Q Okay. What does that entail?

2 A Well, as I was saying before, we realized that for some
3 complex issues the 13 or 15 CODIS approved STR loci may not be
4 enough.

5 Q Okay.

6 A So as we did the work in 1992, these 13 loci came from
7 our initial position that from the genome wide battery of
8 polymorphic markers, these STR loci are good candidates for
9 forensic use.

10 Now we can ask the question is there -- are there other
11 loci in the genome that can be folded into forensic use --

12 Q Okay.

13 A -- for solving complex cases. Now the technology is --
14 as in the genome research is changing from PCR based STR typing
15 to what they call single nucleotide polymorphism studies. So
16 the question that I'm now asking is, is the SNP single
17 nucleotide polymorphism technology, can it be used in
18 forensics. What kind of platform would be needed, what kind of
19 validation work we need to do. So these are the issues that
20 I'm asking in my pending proposal now.

21 Q Now you've also listed here on page 8 that you have a
22 number of years of field experiences, and I want to
23 specifically direct your attention to your work since 1989. Is
24 it fair to say that you have directed various statistical
25 analyses of DNA typing for forensic use?

26 A Yes.

27 Q What types of -- starting in 1989, what types of
28 statistical analyses have you been involved in?

1 A Well, in the initial years from 1989 to 1994 this was
2 mainly the analysis and comparison of the databases being
3 prepared by the TWGDAM group, T-W-G-D-A-M, and then after that
4 the same group of laboratories were also denoting the PCR based
5 databases, and when the PCR based databases were being
6 discussion prepared not only laboratories from USA consulted
7 me, laboratories from Brazil, Canada, Spain, United Kingdom, as
8 well as Switzerland sent me the data for validation.

9 And the validation work consisted of several things.
10 First of all cross-examination of the data to see the internal
11 consistency of the data. Because there are some analyses that
12 can be done to see whether the laboratory during the time span
13 that did the work did the work consistently. We do that in
14 industry quality controls or quality control monitoring. Such
15 monitoring things can be done there with such forensic data
16 also. So these are not really testing any hypothesis or
17 anything like that. Looking for internal consistency of the
18 data.

19 And second is that is the product rule valid. Are the
20 loci independent. Those questions can be addressed --

21 (Reporter interrupted.)

22 THE WITNESS: The forensic databases are not really
23 ideally random samples. They're more convenient samples. The
24 individuals are not selected by a computer at random from the
25 whole country. Not that it is bad, but once it is done like
26 that then you cannot be 100 percent sure that the database does
27 not contain any relatives. Relative individuals. So there are
28 some checks that can be done to find out whether or not

1 databases contain relatives.

2 Q (By MS. SCHUBERT) Okay. Is it fair to say that with
3 respect to your field experience in forensic DNA typing,
4 statistical interpretations, that since 1989 until the present
5 that you have -- you have been involved in essentially
6 validating the appropriateness of the product rule as it
7 applies to DNA forensics?

8 MR. LYNCH: I'd object. One, it's leading. And two, I'm
9 not sure what she means by essentially validating.

10 MS. SCHUBERT: Well, I can rephrase it.

11 THE COURT: Let's try to do that.

12 Q (By MS. SCHUBERT) Is it fair to say, Doctor, that since
13 1989 you have been involved in the directing of statistical
14 analysis of DNA typing of human populations persisting in the
15 determination of the scientific validity of the product rule?

16 A Yes. But as I said before, my work did not really
17 restrict to validating the product rule only.

18 Q Okay.

19 A My statistical assessment of databases encompasses many
20 other things. Like whether or not the population name is
21 appropriate, whether or not the data is internally consistent,
22 there is -- to what extent relatives might be involved in the
23 specific databases, and how does that differ from one country
24 to the other or one database to the other.

25 Q Okay. Fair enough. Now in terms of -- in terms of your
26 work in the area of DNA forensics, have you been called upon as
27 a consultant to various forensic laboratories both in the
28 United States and as well as internationally?

1 A Yes.

2 Q How many -- first of all, if you know, approximately how
3 many forensic DNA laboratories are there in the U.S.?

4 A It's very difficult to give an exact count because of the
5 fact that there are a number of laboratories who do DNA work
6 but they are not approved as CODIS laboratories. But I have
7 consulted over 60 different laboratories in this country.

8 Q 60 or 16?

9 A Six-zero.

10 Q Okay. In the United States?

11 A Correct.

12 Q Have you consulted other forensics laboratories
13 internationally?

14 A Yes.

15 Q What types of countries are we talking about?

16 A Canada. The laboratories are all Canadian or Royal Mount
17 Police Laboratory, RCMP approved laboratories in Alberta,
18 British Columbia, in Halifax. At least three laboratories.

19 In Brazil, in Belo Horizonte B-E-L-O, Horizonte,
20 H-O-R-I-Z-O-N-T-E. Then in Curitiba --

21 Q That's a hard one.

22 A C-U-R-I-T-I-B-A, it's in southern Brazil. Then in
23 Uruguay in Montevideo. And then in Chile in Santiago. Then in
24 Columbia in Cali and Bogota. Then in India the laboratories
25 from Hyderabad, H-Y-D-E-R-A-B-A-D. And also in Calcutta,
26 Central Forensic Science Laboratory. In Japan, Tokyo and
27 Kyoto. In Germany, in Frankfurt laboratory and laboratory in
28 Bremen, B-R-E-M-E-N, in northern Germany. And then I've seen

1 reviewed some data from Peter Gills Laboratory in England.

2 Q Peter Gills?

3 A Peter Gills Laboratory in England, correct. I've
4 examined some data from an Australian laboratory in Melbourne.

5 I may have missed some, but these are essential things.

6 Q Okay. Now the labs that you're mentioning now, say the
7 U.S. labs, the ones that you said you've consulted over 60 U.S.
8 labs, are those laboratories that are connected with the CODIS
9 system?

10 A CODIS and our SWGDAM.

11 Q Meaning that they are connected to the felon databank run
12 by the State?

13 A Yes.

14 Q And how about internationally? Have you consulted -- the
15 labs you just mentioned internationally, are those laboratories
16 that are connected to whatever individual country has a felon
17 databank?

18 A Right. The laboratory in England, Peter Bills
19 Laboratory, has a felon database as well. But the validation
20 studies with respect to databases, those are for what they call
21 the population databases.

22 Q Okay. There's a difference between the population
23 database and the felon database?

24 A Felon database. In fact, in most -- in most of the
25 countries, like our own in the United States, the felon
26 database has restrictive use. Felon database can be -- access
27 to felon database can be made only under prescribed situations.
28 Felon database is to be used for an investigative purposes

1 alone. It is not open to any kind of research.

2 Q Okay.

3 A As a consequence, statistics are never provided based on
4 characteristics of felon database.

5 Q Okay. Let me go into that a little bit later after I
6 finish going through your c.v. also. Now you've listed here --
7 I know we talked a little about that you've done a large amount
8 of research in the area of DNA forensics, correct?

9 A Correct.

10 Q And specifically in the area of human population
11 genetics?

12 A Yes.

13 Q You've also written a lot of articles dealing with human
14 population genetics?

15 A Yes.

16 Q As it relates to forensics?

17 A Yes.

18 Q How many, if you could estimate, you've got here listed
19 starting on page -- page 13 you've got listed experience in
20 applications of genetics in basic sciences, law, and forensics.

21 A Correct.

22 Q Under that particular area on your c.v. do you detail
23 about, first of all, approximately how many papers and
24 scientific journals you've published in the area of DNA
25 forensics?

26 A Well, this section is more -- that's not really a list of
27 all of my research papers in the area of DNA forensics. These
28 are -- from page 13 to 18 are listed my experience in

1 applications of genetics in science, law, and forensics. So
2 these are like seminars that I gave at meetings or the reviews
3 that I did in the context of analysis of databases and things
4 like that. So there are 80 such items listed.

5 Q Okay. Can you just --

6 A Eight-zero.

7 Q I don't want you to necessarily go through all of them,
8 but in terms of your expertise in the area of forensic DNA, can
9 you tell us essentially what these -- what you detailed here?

10 A Yeah. Just to give an example, let me take the most
11 recent one. In the first week of November I was in Columbia,
12 Bogota. So in Columbia, Bogota there are six laboratories that
13 are being contemplated to be used for setting up something like
14 offender database. Now the six laboratories include some
15 laboratories in the southeastern part of the country where
16 there are individuals of Oriental mixture.

17 So the question asked to me is how big the offenders
18 database has to be before it is of any use in my applications
19 in Columbia. So I presented a talk called genotype and allele
20 sharing in databases, and do the observations meet the
21 expectations based on the analysis of the worldwide databases.
22 So that I could show to them even in populations of remote
23 origin the same expectations hold if you do the statistics
24 appropriately.

25 Q Okay. Now in addition to your talk in Columbia, in terms
26 of your expertise in forensic DNA you've indicated here
27 starting off as of 1974 to the present that you published over
28 120 papers dealing with the area of forensic DNA, correct?

1 A Correct.

2 Q Okay. And you've also testified as an expert in numerous
3 court proceedings?

4 A Right.

5 Q You also from 1989 to the present a consultant to the FBI
6 academy with respect to by statistical and population genetics
7 in DNA forensics?

8 A Yes.

9 Q Okay. And then you listed out here numbers of
10 conferences that you've attended dealing with DNA forensics,
11 correct?

12 A Yes.

13 Q Item number 36, you mention 1998 you're the moderator of
14 a session on CODIS experience with STRs. What did that
15 involve?

16 A That was probably in the year on 1998 when the CODIS just
17 started working officially. As a consequence we -- the CODIS
18 users asked the question that since some of the early data on
19 in CODIS was on RFLPs or how the situation has changed when the
20 STR loci are looked at in comparison to the RFLP data. So you
21 remember that for the RFLP loci we -- that the CODIS were using
22 somewhere between six to eight probes. For STR, although
23 initially it started with nine loci, now there are 13 loci. So
24 is there a major change in the experience of using the CODIS
25 data with RFLP loci versus STR loci.

26 THE COURT: Let me make sure I understand something. The
27 RFLP used how many loci?

28 THE WITNESS: Six to eight.

1 THE COURT: Okay. And then STR started with nine and
2 now --

3 THE WITNESS: Now it is 13 and soon it will be 15.

4 Q (By MS. SCHUBERT) Now you mentioned that there's a thing
5 called a CODIS users group?

6 A Correct.

7 Q Is that something that you're part of?

8 A Well, I'm not a CODIS user myself. But like the SWGDAM,
9 attending the SWGDAM meetings, I attend almost every CODIS user
10 group meeting as the lecturer or a faculty member.

11 Q Okay. So with respect to the CODIS user group meetings,
12 is it a fair statement that you interact with laboratory
13 directors or members of the CODIS DNA databanks, felon
14 databanks from across the country?

15 A Yes.

16 Q Now you've also indicated in here on your experience with
17 forensics that you have been called upon a number of times to
18 be a guest speaker on population genetics?

19 A Yes.

20 Q Was one of those was the National Commission on the
21 Future of DNA Evidence?

22 A Yes.

23 Q What is -- what was that?

24 A Well, as the national DNA Advisory Board was finishing
25 their charter, there was another committee created -- I think
26 again recommended by FBI director, but its sponsorship could
27 have been from other organizations also. It was called
28 National Commission of Future of DNA. Its mission was to look

1 at the entire science of recombinant DNA and to see what else
2 DNA forensics can utilize and where the future of DNA forensics
3 would be. So they asked several experts in the field to tell
4 their views on this subject.

5 Q Okay. And you were one of them?

6 A Correct.

7 Q And it appear from your c.v. that you have been asked
8 several times to come and talk to the CODIS users group,
9 correct?

10 A Yes.

11 Q Now you also have been called upon for several years to
12 be a consultant to the FBI?

13 A Yes.

14 Q And other government agencies dealing with forensic labs?

15 A Correct.

16 Q Now how many articles in addition to the 120 that deal
17 with specifically a forensic DNA analysis, how many articles in
18 total have you authored?

19 A Over 500.

20 Q Over 500. And I don't know if they're all here on your
21 c.v. or not, but do they -- is there a particular subject
22 matter that the majority of those articles deal with?

23 A Well, majority of my articles deal with how variation at
24 the level of DNA can be characterized. What are the mechanisms
25 to which such variations are produced and maintained in
26 population.

27 Q Okay.

28 A And then to look at how they can be used for different

1 purposes, which region of the genome -- which characteristics
2 of the region of the genome make the marker more useful in
3 certain context as opposed to others.

4 Q Okay. In terms of your experience in the area of
5 forensic DNA analysis, have you been called upon as an expert
6 to -- in California and other places to testify not just in the
7 area of statistical interpretations but also the DNA
8 methodology in a particular case?

9 A Yes, a number of times.

10 Q If you can, I don't know if you can estimate for us how
11 many times have you been called as an expert in forensic DNA
12 analysis.

13 A Well, I would answer that question two parts. I would
14 say -- I would first say that over the years from 1991 I have
15 reviewed more than 250 court cases. In not -- so I've opined
16 on in that many cases. But in not all cases I had to appear in
17 court.

18 Q Okay.

19 A So I would say that I have appeared in court and was
20 established as an expert in more than 80 cases. Eight-zero.

21 Q Okay. Now in terms of your expertise, have you testified
22 as an expert in terms of what is -- in admissibility hearings?

23 A Yes.

24 Q At what types of jurisdictions are we talking about have
25 you testified?

26 A In district courts, appellate courts, also federal
27 courts.

28 Q Okay. How many different states, if you know?

1 A A number. I think it's listed as the last item. Alaska,
2 Arizona, California, District of Columbia, Florida, Louisiana,
3 Massachusetts, Michigan, Minnesota, Mississippi, New Hampshire,
4 Nebraska, Nevada, New Mexico, Ohio, Oregon, Pennsylvania, South
5 Dakota, state of Washington, Texas, and in Canada Alberta and
6 British Columbia.

7 Q Okay. Now with respect to your testifying as an expert
8 in California, did you testify in the People versus Soto case?

9 A Yes.

10 Q Did you also testify in the People versus Vanegas case?

11 A Yes.

12 Q Then finally, Doctor, with respect to your
13 qualifications, People's Exhibit 20, just so I don't have to go
14 through every single page, is it fair to say that pages 1
15 through -- I'm not sure what the last page on that exhibit is,
16 63, is a fair representation of your both educational
17 background as well as professional experience since the time
18 that you have gone to school?

19 A Yes.

20 Q Okay.

21 MS. SCHUBERT: At this time I would offer Dr. Chakraborty
22 as an expert in the area of DNA analysis, including the area of
23 population genetics.

24 THE COURT: All right. Mr. Lynch.

25 MR. LYNCH: Thank you, your Honor.

26 ///

27 ///

28 VOIR DIRE EXAMINATION

1 BY DAVID LYNCH, Assistant Public Defender, Counsel for the
2 Defendant:

3 Q We'll get into your background a little bit. We talked a
4 lot about databases in general. Would it be fair to say that
5 there are certainly two kinds of database, a population
6 database and an offender database?

7 A Yes.

8 Q When you're dealing with issues with a population
9 database, generally you're dealing with issues to discern
10 whether or not there's any substructure, whether or not you're
11 in equilibrium, whether or not it's valid for using the product
12 rule, correct?

13 A Yes.

14 Q And sometimes you're also looking at whether or not the
15 method that's used to generate the database have been correctly
16 performed, correct?

17 A Yes.

18 Q Okay. But those issues are different and separate to the
19 issues that arise with an offender database, correct?

20 MS. SCHUBERT: Objection. Relevance at this point.

21 MR. LYNCH: Your Honor, I'm just clarifying the terms so
22 when we go through the voir dire we'll understand what is more
23 significant and what is less significant.

24 THE COURT: I'll permit it.

25 MR. LYNCH: Thank you.

26 Q So the issues that -- the issues that you deal with when
27 you look at an offender database are different issues to the
28 ones that you look at when you look at the population database,

1 correct?

2 A No, there are -- some issues are the same.

3 Q Okay. What issues are the same?

4 A For example, the typing technology.

5 Q Okay. But if --

6 A The proficiency testing of the analysts, the quality
7 control and quality assurance issues, these are the same for
8 offenders and population database.

9 Q Okay. But when we're talking about the statistics, when
10 you deal with statistical tests and analyses of a population
11 database, those statistical tests and analyses are directed at
12 discerning whether or not the population is in equilibrium,
13 correct?

14 A Yes.

15 Q The statistics use from an offender database are usually
16 those that are related to whether or not -- or how significant
17 the match is, correct?

18 A Actually, there's no statistics done from the offenders
19 database.

20 Q Okay. There's no statistics generated from the database,
21 but when you get a hit from an offender database there are
22 statistics that are calculated and presented in court as to the
23 significance -- or the random match probability, the
24 significance --

25 A Using population database.

26 Q Okay. My question is that the analyses that you do on
27 population databases are different to the analysis that ends up
28 getting presented in court, which is basically a summary --

1 MS. SCHUBERT: I'm going to object at this point as to
2 relevance as to voir dire, Judge.

3 MR. LYNCH: I'm trying to clarify the terms, Judge.

4 THE COURT: I guess I'll permit that question, but I
5 think you're going to have to restate it, and it's not
6 completely clear to me.

7 MR. LYNCH: I think we are getting complicated here
8 moving into the substance, so I will just get to the voir dire
9 questions at this time, your Honor.

10 THE COURT: All right. I think that's a good plan.

11 Q (By MR. LYNCH) So you indicated that you first got your
12 first training at the Indian Statistical Institute?

13 A Correct.

14 Q Is that a university?

15 A That's not a regular university, but it's a degree
16 granting organization.

17 Q What do you mean by it's not a regular university?

18 A It's -- for example, analog in this country would be
19 Massachusetts Institute of Technology, MIT. They give masters
20 and Ph.D. degrees, but it's not a university. It's affiliated
21 with Harvard University.

22 Q Okay.

23 A California Institute of Technology. Indian Statistical
24 Institute is an institute of similar stature, if not higher.

25 Q Okay. Well, you say it's affiliated with something.
26 What is the Indian Statistical Institute affiliated with?

27 A It's affiliated with University of Calcutta.

28 Q And you got your statistics -- bachelors in statistics,

1 correct?

2 A Yes.

3 Q You got a masters in statistics, and I believe your
4 resume mentions mathematical genetics.

5 A Correct.

6 Q What exactly is mathematical genetics?

7 A Population genetics is a part of mathematical genetics.
8 The mathematical genetics is a little bit more broader in the
9 sense it also deals with the mechanistic explanation, modelling
10 of mechanic -- genetic mechanisms, likely combinations,
11 mutation, and things like that.

12 Q So did you study human populations at that point in time?

13 A Yes.

14 Q Okay.

15 A All of my laboratory work dealt with human population.

16 Q Did you study -- did you do experiments on human
17 populations?

18 A Yes.

19 Q Did you study nonhuman populations?

20 A To some extent, yes.

21 Q Okay. And why would you study nonhuman populations?

22 A To look at some evolutionary issues, those that are more
23 difficult to answer with human populations. For example, we
24 talk about a phenomenon like effect of finite population. Over
25 time the changes, genetic changes in a finite population cannot
26 be truly done in a human population because obviously my next
27 generation will not be directly observed by me. But with
28 organisms like fish or house flies, those things can be done.

1 So during 1980s, in fact, we did some experiments with
2 fish populations to study the effect of finite population on
3 genetic changes.

4 Q Would it be fair to say --

5 THE COURT: Just a second. To study the effects of --

6 THE WITNESS: Finite population.

7 THE COURT: On?

8 THE WITNESS: On genetic changes.

9 THE COURT: On genetic changes. Thank you.

10 Q (By MR. LYNCH) Would it be fair to a that a lot of
11 statistical information comes from the study of nonhuman
12 populations such as flies and fishes?

13 A Some, yes. I wouldn't say -- I won't say a lot. Some
14 do, yes.

15 Q Well, the concept of the product rule was developed from
16 studies on nonhuman populations, correct?

17 MS. SCHUBERT: I'm going to object to at this point to
18 relevance to voir dire, Judge.

19 THE COURT: What's the relevance?

20 MR. LYNCH: I'm just establishing the basic stuff before
21 I go into --

22 THE COURT: What?

23 MR. LYNCH: I'm just establishing some basic facts before
24 we go -- he's telling us he's a population geneticist as
25 opposed to human population, and there's differences and we
26 need to know what those are in order to understand your --

27 THE COURT: I don't sense your question is doing that.

28 MR. LYNCH: Let me ask another question then, your Honor.

1 Q What is the difference between a human population
2 geneticist and a population geneticist?

3 A The differences are subtle in the sense that there are
4 some issues in human population genetics that are very
5 difficult to have good idea on if you are trending population
6 genetics alone.

7 Q Okay. What would those issues be? Would they be
8 relevant to --

9 A For example, since we can talk to our study subjects, we
10 can distinguish the study subjects in human much better than if
11 you're studying drosophila, D-R-O-S-O-P-H-I-L-L-A -- or L-A.
12 Single A. For example, suppose I look at individuals in this
13 room. Without even any knowledge of sociology or anthropology
14 we can immediately well, the individuals presented in this room
15 do not necessarily come from a single homogenous population.

16 But if you were looking at fruit flies, collecting them
17 from a bottle in which you put squashed banana so that every
18 hungry fly will get into it, in the morning when you got the
19 fifty flies you do not know whether it was the whole hungry
20 family that came in or fifty other different unrelated flies
21 came in.

22 Q Okay.

23 A So that distinguishing in human you can make very easily
24 without even studying the underlying subject. But in other
25 population genetics you never ask that question.

26 Q Well, summarizing then, you can get different information
27 from doing tests on humans than you can do on fruit flies?

28 A Right.

1 Q Okay.

2 A So if you were trained as a population geneticist in
3 general you may not be looking for such intricate differences,
4 which one has to more be more worried about in the human
5 population genetic.

6 Q When we're talking about the study or the application of
7 the product rule, those subtle differences aren't important
8 once we've got a population database that we've determined to
9 be accurate and reliable, whether your background is in human
10 genetics or just population genetics you're still going to be
11 able to apply the product rule and draw inferences and do work
12 on that, correct?

13 MS. SCHUBERT: I'm going to object again as to beyond the
14 scope of voir dire, Judge.

15 THE COURT: It sounds like it's beyond the scope, as well
16 as almost unintelligible.

17 Q (By MR. LYNCH) Well, you got your masters in
18 mathematical genetics. Did you do any DNA work at that point
19 in time?

20 A I was -- DNA was discovered by then. DNA double helix
21 was discovered in 1953. In 1971 there was -- I don't think
22 there was any paper on population genetics with DNA.

23 Q So you did none in your masters?

24 A We knew what DNA is about, but DNA research did not start
25 until 1978 when Dr. Southern discovered how to do the work with
26 DNA population level.

27 Q What about your Ph.D.? Did you do any DNA work in your
28 Ph.D.?

1 A No. On my Ph.D. degree was also predated DNA laboratory
2 work. My Ph.D. was done in 1971. 1978, it was the time when
3 we first came to know when we can work with DNA at a population
4 level.

5 Q Okay. Now your first full time appointment in the U.S.
6 was with the University of Texas in 1973?

7 A Correct.

8 Q You started off as a student, then became a professor?

9 A Not a student. I was -- I post-doctorate fellow for
10 six weeks, after which I became an assistant professor. I
11 joined in February of 1973 and made an assistant professor in
12 April 1.

13 THE COURT: You were a post-doctorate fellow?

14 THE WITNESS: Post-doctorate fellow, yes.

15 THE COURT: Okay.

16 Q (By MR. LYNCH) Since then until your latest trip to
17 Cincinnati, you've been working at two places, at the
18 University of Texas, fair to say, the Demographic and
19 Population Genetic Center and the School of Public Health?

20 A Well, it's somewhat a misinterpretation. In 1973 our
21 center was the called Center for the Demographic and Population
22 Genetics. We were part of the graduate school of our medical
23 sciences of the University of Texas Health Science Center.

24 In 19 -- I believe it was '86 or '87 there was a change
25 in the administration of the University of Texas Health Science
26 Center. Faculty members could not be -- faculty members had to
27 be associated with a professional school. Graduate school of
28 our medical science was a teaching school. So our center was

1 assigned to School of Public Health. Our academic appointment
2 moved to School of Public Health.

3 And then at the retirement of our founding director, the
4 name of the center also changed. It became Human Genetic
5 Center. So it's not really two appointments. It's the same
6 appointment changed its name -- affiliation changed with time.

7 Q And besides teaching were you doing any research during
8 the period of 1973 to 2001?

9 A Yes.

10 Q Okay. Your research began focused on Indian populations;
11 is that correct?

12 A Yes. In India my research was on Indian population.

13 Q Started off with surnames, diseases, print ridges, things
14 like that?

15 A Yes. Including dermatoglyphics. The fingerprints.

16 Q When did you first start doing studies relating to human
17 DNA?

18 A Human DNA?

19 Q Yes.

20 A Or human genetic markers? Which?

21 Q Human DNA.

22 A 1976.

23 Q Okay. And when did you first start doing research or
24 investigation, if any, relating to human DNA for identification
25 purposes as opposed to health or medical purposes?

26 A I would say my first paper on use of human DNA for
27 identification was in 1984. Soon after Alex Jeffrey's
28 discovery -- J-E-F-F-R-E-Y -- of DNA fingerprinting.

1 Q Would you say your focus for research during the time
2 that you were in Texas, University of Texas, was more on
3 population genetics relating to study of disease or population
4 genetics relating to forensics?

5 THE COURT: Let me see if I understand something. He was
6 at the University of Texas for a long time, was he not?

7 MR. LYNCH: Yeah. '73 to 2001.

8 THE COURT: Well, I don't know if that's a question he
9 can answer.

10 Can you describe almost 30 years as being primarily on
11 one subject?

12 THE WITNESS: Absolutely not.

13 Q (By MR. LYNCH) Okay.

14 A I was -- as I told, that my research has three threads in
15 it all intertwined. One is what is the extent of genetic
16 variation between individuals within as well as across
17 populations. And second is how can we use that information for
18 practical purposes. One purpose for which I -- in which I
19 spent my major time is discovery for genes underlying complex
20 diseases. And second application is DNA forensics,
21 identification, parentage testing, risk assessment.

22 Q Okay. You said you spent the majority of your time
23 relating to disease rather than identification; is that fair to
24 say?

25 A Yes.

26 Q How much percentage of your time do you spent on
27 identification?

28 A That's to some extent reflected in a number of

1 publications. If 120 of my 500-plus papers are in DNA
2 forensics, I'm saying -- I would say a quarter percent,
3 25 percent of my time is on DNA forensics and related questions
4 and 75 percent times on other issues.

5 Q Okay. At your current position is your research into
6 identification roles of DNA part of your job?

7 A Yes. That's one of my active research projects.

8 Q Okay. Are you a member of National Academy of Science?

9 A No.

10 Q Are you a member of National Research Council?

11 A Actually there is no membership in National Research
12 Council. National Research Council is an arm of the National
13 Academy of Science. The council members are selected or based
14 on the specific issues. No, I have not been a member of
15 National Research Council related to DNA forensics. But I was
16 a member of the National Research Council committee of effect
17 of radiation on health.

18 Q Okay. But for DNA purposes you weren't selected to be to
19 National Research Council --

20 A No.

21 Q -- that promulgated the two books known as NRC-1 and
22 NRC-2?

23 A No, I was not a committee member in either of them.

24 Q Have you ever done STR testing for case work?

25 A Case work?

26 Q For criminal cases?

27 A Case work, no.

28 Q Have you ever done work in a forensic criminal lab?

1 A What do you mean by work? You have to define.

2 Q Well, besides observing, have you ever actually been in
3 there performing DNA testing in a criminal lab a district
4 attorney's lab, a county lab, the FBI lab?

5 A No.

6 Q Have you ever followed a case through inception to the
7 end as an observer in DNA forensics?

8 A Yes, I have done that.

9 Q That was the case I think you talked about where you did
10 some investigation. We'll get into that later.

11 Have you ever done research for a forensic lab? Have
12 they ever asked you to do research on things that they are
13 discovering happening in their lab?

14 A Yes.

15 Q What kind of research have you done?

16 A Well, for example, as I said, I validated but in a broad
17 sense the databases of the Orange County laboratory from RFLP
18 days, and then similarly for a Metro-Dade County I have
19 validated their databases. Suffolk County, New York, I've done
20 that. And then combined CODIS databases, population databases.

21 Q Now you indicated when you were talking to the district
22 attorney that you went -- your first foray into this field of
23 forensic DNA was with parentage testing; is that correct?

24 A Correct.

25 Q Now parentage testing with DNA is different to
26 identification testing where you're seeing if somebody is a
27 match, correct?

28 A I don't see -- understand your question. What do you

1 mean by different?

2 Q Well, let me try it -- if you're testing a child or
3 you're trying to see if I'm the father, you test me and the
4 child and you're not expecting an exact match, DNA match,
5 correct?

6 A No.

7 Q The way you investigate whether somebody is the father or
8 not is you look at the occurrence of the matching alleles and
9 the number of nonmatching alleles and you do some statistical
10 analysis of that to determine how likely I am the father,
11 correct?

12 A Yes.

13 Q Whereas if we're talking about identification cases, you
14 would compare me to maybe some evidence, and unless there was a
15 complete match at all the alleles you wouldn't do any
16 statistics, correct?

17 A It depends on upon the question you're going to answer.

18 Q What if I'm asking if I was the source of the evidence
19 material? You would expect before you did any statistics that
20 there would be a match at all the loci?

21 A Well, the issue might come up whether the mismatch that
22 you're finding is due to your faulty typing procedure.

23 Q Okay. But typing procedures aside, just on the
24 statistics we're talking a different manner of analysis between
25 parentage testing and identification testing, correct?

26 A Yes. You ask different questions, you use different
27 statistics, you get different answers. But the principles are
28 the same. Principles meaning these genetic markers follow some

1 rules, and the same rules are applied in answering these
2 different questions.

3 Q Except --

4 A But the question in forensic identity testing is more
5 often different from questions asked in parentage testing. As
6 a consequence, the different formulae, different methods are
7 used.

8 Q Okay.

9 A But the principles are the same.

10 Q Now you said were you a member of TWGDAM as a faculty
11 member when you were talking to the district attorney. What
12 does that mean, you're a faculty member of TWGDAM?

13 A TWGDAM is a community is a group of forensic analysts or
14 laboratory -- directors of laboratories who are doing on a
15 day-in-day-out basis of forensics related work. Since I do not
16 belong to any such laboratory, I'm not a formal TWGDAM member.
17 But the issues discussed in the TWGDAM meeting and the agenda
18 of their meeting, namely the continuing education part,
19 involves members who go and lecture in front of them or listen
20 to their issues and advises them. And I have been doing that
21 to them since 1989.

22 Q Would it be fair to say that TWGDAM focuses generally on
23 the methods used, the forensic typing methods more than the
24 statistics?

25 A Not necessarily.

26 Q Okay.

27 A There were times when all the four meetings of the year
28 were on statistical issues.

1 Q Okay. But the majority of the issues relate to quality
2 control methods, appropriate methods to be using and the
3 physical testing of the DNA, correct?

4 A Most of the time, yes.

5 Q And have you -- you've been an invited expert
6 occasionally. Have you ever attended any meetings where the
7 correct procedures to be used in a cold hit case, criminal
8 case, have been concerned?

9 A I didn't understand your question. You had too many
10 things. One thing that I didn't understand is what do you mean
11 by correct?

12 Q Okay. Well, let me just clarify what I'm -- when I'm
13 talking about cold hits --

14 A Yes.

15 Q -- I use that term to mean an example where somebody
16 previously unsuspected is located because the evidence is
17 searched, the evidence profile is searched through a massive
18 database of offenders.

19 MS. SCHUBERT: I'm going to object at this point on
20 relevance.

21 MR. LYNCH: That's a cold hit. I'm asking him his
22 expertise on that.

23 THE WITNESS: That's your --

24 THE COURT: I'll permit that question.

25 MR. LYNCH: Okay.

26 THE WITNESS: That's your definition of cold hit?

27 Q (By MR. LYNCH) Yes. So when I ask my question, that's
28 what I mean by cold hit.

1 A I don't think there is any database of unsuspected people
2 that is searched for cold hit.

3 Q I'm sorry?

4 A I don't think there is an unsuspected people's database
5 that is searched for cold hit.

6 Q Okay. You're familiar with database searches of offender
7 databases, correct?

8 A Yes. Offenders database by definition is a database of
9 persons with previous criminal history.

10 Q Okay. Now when a database search is done, is it a
11 prerequisite to your knowledge that the police must have some
12 indication as to who is involved in the crime?

13 MS. SCHUBERT: I'm going to object at this point to
14 relevance as to expertise.

15 THE COURT: Sustained.

16 MR. LYNCH: We were just trying to establish what the
17 meaning of cold hit was, and he objected to my definition so
18 before we proceeded I needed to establish that.

19 THE COURT: I'm going to sustain the objection.

20 MR. LYNCH: Okay.

21 Q We were talking about TWGDAM meetings and your
22 presentations. Have you done any presentations or been present
23 at any TWGDAM meetings when the topic of the appropriate
24 statistics to be used in a cold hit case, a case that has
25 result from a database search of a convicted offender database
26 been involved?

27 A Yes.

28 Q Okay. And how many times has that discussion arisen?

1 A Well, I -- it's difficult to say how many times, but I
2 would say that during 1998, 1999 there were at least three or
3 four meetings in which statistics related to database search
4 originating cases were discussed. And then apart from TWGDAM,
5 as I was saying that I was a member of the national DNA
6 Advisory Board, the database search issues and related
7 statistical issues were discussed in DAB meetings as well. I
8 am -- I was the subcommittee member who had to write the draft
9 DAB recommendation for this part of the DAB recommendation.

10 Q Would that be the section in -- I'm going to show the
11 witness PT -- is that a V? PT-V. That's an article that was I
12 believe in --

13 A Forensic Science Communication, yes. This part of the
14 DAB recommendation was published in Forensic, yes.

15 Q And you're saying you wrote the section that's headed
16 database searches?

17 A Yes, together with three of the subcommittee members I
18 wrote that part.

19 Q And what kind of -- I'll get to that later.

20 You're saying that and the TWGDAM meetings, you also
21 mentioned a New York subcommittee with the district attorney
22 that there were discussions about getting cold hits and how
23 they were presented in court?

24 A Correct.

25 Q What research did you do into that when you were
26 discussing that with the New York subcommittee?

27 A I didn't understand, meaning a research.

28 Q Well, did you do any research before talking with the

1 subcommittee about your opinions on cold hits and how to
2 present them in court?

3 A I would say yes, because the questions that we thought
4 relevant in the cold hit cases are such that they have
5 similarities with some of the questions that I asked in the
6 context of disease gene identification or risk assessment as
7 well.

8 Q So you didn't -- you're saying you didn't do any specific
9 research on cold hit cases for your discussions with the New
10 York subcommittee, you just relied on prior knowledge?

11 THE COURT: Well, just a second. I don't think it's
12 reasonable to focus and say whether he did some specific
13 research for the purpose of talking to one group. The issue
14 would be to me whether he did the research, whether it was
15 specifically for that group or for another group or for an
16 article or whatever. So I think that's a question that could
17 be misunderstood and misleading.

18 MR. LYNCH: Okay. I'll reask it.

19 Q Not just limiting you to the New York subcommittee, but
20 when you've had these discussion at TWGDAM and in preparing
21 your article that we just mentioned, pretrial V, did you do any
22 specific research or investigation before you made your
23 recommendations in each of those proceedings?

24 A Yes, I did.

25 Q Okay. What specific investigation did you do?

26 A (No response.)

27 Q I mean did you rely on your existing knowledge or did you
28 go out and do experiments and research?

1 A I don't understand your question, because what kind of
2 experiment are you thinking about for getting answer for cold
3 hit cases?

4 Q Well, I guess my question is did you do any research.

5 A There's no experiment to be done. Here is a question
6 that has to be addressed. We ask the community of TWGDAM or
7 the bioTWG (phonetic) group in New York as to what do they
8 consider are relevant questions that can be asked in a cold hit
9 cases. Because I'm not sitting in the jury box, I'm not
10 sitting in the honor chair there to decide what would be a
11 relevant question for the court. So we ask them what are the
12 questions, and then we said that this is how a cold hit case is
13 generated, here are the principles which are -- some of the
14 principles are much older than my grandfather so you don't need
15 to do any experiments to validate them. So you use those
16 principles and give the answer.

17 Q Okay. Let me try and clarify. I'm not sure from your
18 answer, are you saying that you went to TWGDAM and they told
19 you what they considered the relevant questions were and then
20 you answered them?

21 A No. I -- if I gave the particular description of what a
22 cold hit case is, I can enumerate a number of questions.
23 Multiple questions can be asked.

24 Q I understand. My question is, did TWGDAM tell you the
25 questions they were interested in and you responded with your
26 information on how to deal with those questions?

27 A Right.

28 Q Or did you come up with the questions?

1 A When I lecture on this topic, as I did since 1998, I said
2 a cold hit case is described as follows, I give a description.
3 And once it is described in this fashion, you can ask a number
4 of alternative questions. And the answer for the first
5 question needs to be done this way, the answer for the second
6 question is this way, third question this way, and so on. And
7 it is up to the community to define the relevant questions and
8 take the recommended answer.

9 Q Okay. So when you were dealing with TWGDAM and you were
10 dealing with writing this article and talking with the New York
11 subcommittee you were not coming forth yourself with relevant
12 questions, you were relying on them to give you the questions
13 and then you would do your best to answer, correct?

14 A Well, that's again not a correct representation of how
15 these proceedings are written or went. The -- as in other some
16 other forensic case work depending upon the scenario different
17 questions can be asked. It is up to the forensic analyst to
18 define what the relevant question would be in the context of
19 his or her case. It is up to the court to decide well, what
20 relevant questions can be asked -- or answered.

21 As a scientist, my objective was to show that a cold hit
22 case could be modelled as follows, and once it is modeled in
23 the following fashion then a number of alternative questions
24 can be asked. And for each of these questions here are the
25 principles, some of which are age-old verified, that can be
26 used to get such-and-such answer. So if you change the
27 question, the answer is different.

28 Now someone does not distinguish between the different

1 questions, look at the different answers, they might call it a
2 controversy.

3 Q Well, here's my question. Have you done any
4 investigation or research into what statisticians and
5 mathematicians in the scientific community feel are the
6 relevant questions in a database or cold hit case?

7 A Yes, I have done that research.

8 Q Okay. How did you undertake that research?

9 A Literature search, reading the articles.

10 Q Okay. So --

11 A Talking to fellows in scientific meetings.

12 Q Okay. So both anecdotal in the sense that you would talk
13 to people at meetings, and I guess more objective in the sense
14 that you would read articles that have been published, correct?

15 A Yes.

16 Q Okay. What articles have you read discussing the correct
17 or appropriate issues to be resolved in a cold hit case?

18 A Again, your question is rather complicated.

19 Q Okay. Well, let me ask you some more specific ones.

20 A If -- maybe my answer would be different than saying what
21 articles did you read because not everything that's printed is
22 correct.

23 Q Okay. Well, start at the appropriate end of this stack.

24 Did you read the article by Anders Stockmar -- I can
25 spell these later -- Likelihood Ratios for Evaluating DNA
26 Evidence When the Suspect Is Found Through a Database Search?
27 That's PT-W.

28 A I have not written any -- read any article numbered PT-W

1 but --

2 Q I'm sorry, PT-W is the exhibit number.

3 A If the article is published in -- a periodical article
4 published in Biometrics in 1999, yes, I've read that one.

5 Q You've read that one? And what about -- this is PT-Y --
6 by Balding and Donnelly, Evaluating DNA Profile Evidence When
7 the Suspect Is Identified Through a Database Search?

8 A Is it a Journal of Forensic Science paper.

9 Q I believe it is?

10 A Yes, I've read that.

11 Q May as well get back to the Stockmar.

12 Did you follow up on the Stockmar article and read the
13 comment that was later published and then Stockmar's reply to
14 the comment?

15 A Yes.

16 MS. SCHUBERT: I'm sorry, I don't think I have a copy of
17 that.

18 MR. LYNCH: That's PT-DD. I guess we're in double
19 letters now.

20 Q Did you read the book by Evett and Weir, specifically
21 chapter nine which talks about presenting evidence in a cold
22 hit case? You did you read that?

23 A Yes.

24 Q You read chapter nine?

25 A Yes.

26 Q That's PT-Z.

27 THE COURT: I think we've reached the 12 o'clock hour, so
28 we'll take our recess at this time. We'll be in recess until

1 1:30 this afternoon, and we'll continue at that time.

2 ---o0o---

3 (Proceedings recessed to 1:30 p.m., this department.)

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MONDAY, DECEMBER 30, 2002

AFTERNOON SESSION

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The matter of the People of the State of California versus Paul Eugene Robinson, Defendant, Number 00F06871, came on regularly this day before Honorable Peter Mering, Retired Judge of the Sacramento Superior Court District, State of California, sitting in Department 30.

The People were represented by Anne-Marie Schubert, Deputy District Attorney.

The Defendant, Paul Eugene Robinson, was personally present and represented by David Lynch, Assistant Public Defender and Robert Nelson, Assistant Public Defender, as his counsel.

The following proceedings were then had:

THE COURT: The record will show that all necessary parties are present and our witness, Dr. Chakraborty --

MS. SCHUBERT: Pretty good.

THE COURT: -- is on the witness stand.

The question was asked earlier about whether we could go later today, I -- I don't know. We will have to play it by ear. It's considerably difficult for in-custody processes to stay here after 5:00 o'clock because that means a vehicle has to hang around with staff. But certainly I will be quite willing to go to 5:00 o'clock. I don't know --

MS. SCHUBERT: Okay.

THE COURT: Of course, other staff are sometimes unhappy with that notice as well, but let us proceed then and

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use our time.

CONTINUED TESTIMONY OF

RANAJIT CHAKRABORTY, witness called on behalf of the People,

RESUMED VOIR DIRE EXAMINATION

BY DAVID LYNCH, Assistant Public Defender, Co-counsel on behalf of the Defendant:

Q. Sir, you indicated earlier, I believe, that you hadn't physically tested any DNA or criminal case, but you had followed a case through forensic testing; is that correct?

A. Yes.

Q. And what case was that?

A. Well, at least on one occasion that I individually recollect was when we were -- DAB, DNA Advisory Board members were asked to review the visibility of a blind proficiency testing in a forensic setting. So in that context we went through a couple of proposals for blind proficiency testing which mimics DNA guesswork. So I went through one such exercise right from the inception till the end.

Q. Okay. And was that a cold hit database research case?

A. No, it was not a cold hit database.

Q. You mentioned earlier you got an award for solving some case, what DNA was that related to?

A. I don't think --

Q. "The man of the year award because of my DNA work"?

A. Not for solving a case, for -- for creating a database for the Indian community.

Q. Okay.

THE COURT: I don't think he had suggested or I didn't

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think I heard him say anything about solving a case.

2 MR. LYNCH: I misheard him then.
3 Q. (By MR. LYNCH) So that award for man of the year, was
4 that related to forensic testing then or for, um, medical
5 testing?
6 A. The award was given by a cultural association.
7 Q. Okay. But was this for your work in forensic work or
8 your work in medical work?
9 A. It was for -- my citation said, Dynamic contribution
10 for the community.
11 Q. And my question is, that dynamic contribution, was it
12 for your medical work or was it work in forensic cases?
13 A. Well, the work that closely relates to would be my
14 contribution in DNA forensics.
15 Q. Now, we talked about you having given an opinion to
16 the New York subcommittee at TWGDAM meetings and through your
17 publication by the DNA Advisory Board about cold hit cases.
18 Are there any other forms in which you have presented
19 an opinion as to the relevant questions and issues to be
20 resolved statistically in cold hit cases besides those three?
21 A. Yes.
22 Q. Where else?
23 A. There are a number of cold cases, at least one in King
24 County, State of Washington, one case in Florida that
25 involved, um, suspects identified through cold hits.
26 Q. Okay. Any other instances?
27 A. No. I think in terms of cold cases three or four
28 maybe, at most.

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1 Q. Okay. And did you use that information, in addition to
2 the ones -- the articles and the research we have already
3 discussed, um, to advise in these situations? Is there
4 anything else that you have learned or researched or
5 investigated other than the articles we mentioned and the
6 anecdotal conversations with experts?
7 A. I didn't -- what is your question?
8 Q. Well, we talked earlier --
9 THE COURT: First, we have a little confusion here. I
10 don't think we asked him or you asked him or anyone asked him
11 to list all of the articles that he has read in his field.
12 MR. LYNCH: Okay.
13 THE COURT: You produced a number of articles and asked
14 if he read them.
15 MR. LYNCH: Okay.
16 THE COURT: So your question assumes he has already
17 given us his full extent of reading and studies done.
18 Q. (BY MR. LYNCH) I guess what I'm asking, Doctor, is in
19 addition to reading articles and talking with people at
20 various locations, have you done any investigation or
21 research that you used to advise these people on their cold
22 hit cases?
23 A. In terms of statistical principals, yes. My life-long
24 research has several relevant issues that addresses this
25 question, so it's an accumulation of such experience.
26 Q. I understand you are using your experience or -- did
27 you search out or investigate any particular point or aspect
28 of cold hit cases, other than the things we have talked about

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1 already, in order to advise these agencies about how to
2 proceed?
3 A. I -- my answer would be, yes, because I include
4 statistical reasoning as part of research.
5 Q. Okay. So you sat down and you thought about it; is
6 that what you are saying?
7 A. I'm trying to imply that we at institutions do

8 research, but the answer is no. Statistics is a part of
9 research, and my life-long work in statistical genetics deals
10 with the same principals that need to be attended to in order
11 to answer cold hit relative cases. So I have done thirty
12 years of research that leads to my present opinion.

13 Q. Okay. So you are relying on your existing knowledge.
14 My question is, in addition to your existing knowledge
15 that you've learned over thirty years and the articles that
16 we said that you had read, um, and the people you talked to,
17 did you do anything proactively? Did you go out and say, in
18 order to help advise these people I need to do further
19 research, further investigation? Did you do any of that?

20 A. Well, I have thirty-five years of research experience,
21 if twenty-five percent of research deals with developing
22 principals that are relevant for these, I don't see where
23 else I would get time to do other, whatever you are talking
24 about, proactive research.

25 What I have done is proactive research, and I have
26 simply said, Look, this question can be modeled in this way
27 and the answer because of this principals are these. These
28 are my research, my cumulative knowledge of reading the

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1 literature.

2 Q. Okay. And I'm not debating whether it would be
3 practical or wise or necessary for you to go out and do
4 anything further.

5 My question is -- and I would like to get it in a yes
6 or no format -- did you do anything once you realized you had
7 to advise these people on cold hit cases? Did you do
8 anything specifically to prepare yourself to answer that
9 question?

10 A. Answer is yes because --

11 Q. On what?

12 A. Because I had said -- I have given reasons,
13 specifically, this kind of work that I did answers this
14 question. So my opinion is based on my research on relevant
15 questions.

16 Q. I understand that you are basing it on your prior
17 knowledge.

18 My question is -- again, trying to get it to a yes or
19 no -- did you actually do anything new; did you reread your
20 papers, did you read new papers, did you go and do a clinical
21 study, did you do anything proactive, as in new, along those
22 lines, to answer the question?

23 A. Again, I don't understand your question. Your question
24 presumes -- what I did, um, when I said that question A is
25 mathematically, genetically, biologically similar to question
26 B, which I answered before in relation to my such and such
27 work, that is, in my opinion, a proactive research that I
28 did. So the answer is, yes.

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1 Q. Okay. If that's how you define research, okay, I
2 understand.

3 You said that you served on a editorial board of, I
4 think you mentioned, three indirect examinations but many,
5 many, journals in your tenure as an editorial board member
6 editing and articles. Do you recall how many articles came
7 through that dealt specifically with the issue of the
8 appropriate statistics in cold hit cases on those --

9 A. None.

10 Q. None. So all of the articles that have been published
11 came through journals or magazines or books that were not
12 part of your editorial -- your editorial work?

13 A. Which papers are you referring to now?

14 Q. Okay. Well, you said there were none that came through
15 the group -- none came through your group that you were on
16 the editorial boards for on cold hit statistics, correct?
17 A. Yes.
18 Q. So I'm clarifying -- well, I guess that was the
19 question. We can proceed.
20 You indicated that some of the information you have
21 learned about cold hit cases came from the Promega
22 conference; is that correct?
23 A. Yes.
24 Q. So the issue of the appropriate statistics was
25 raised -- for cold hit cases was raised at the Promega
26 conference?
27 A. Yes. I think so.
28 Q. Do you know who raised it?

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1 A. I cannot -- I won't be able to properly list all of
2 them, but in one conference Bruce Weir presented his way of
3 addressing cold hit cases.
4 Then in another meeting, um, I think it was George
5 Carmoldy who presented interpretation of cold hit statistics.
6 Then in the last meeting David Coffman from Florida presented
7 the experience -- Florida's experience of cold hit cases and
8 presented a summary of the -- um, their SOP or standard
9 operating procedure relevant for cold hit statistics.
10 Q. Okay. So the issue was discussed at one or more than
11 one Promega conference?
12 A. More than one, surely.
13 Q. Okay. Of these -- are these conferences transcribed or
14 published in any way?
15 A. Yeah. Promega conference proceedings use to be
16 published in hard copy until 1998. From 1998 on the
17 proceedings are on CD-Roms.
18 Q. Would you consider these to be peer reviewed
19 publications as described by the District Attorney?
20 A. Uh, in the strict sense, no, but, um, at least --
21 until -- the hard copy versions use to be published. They
22 use to be seen and edited by at least one expert per article.
23 Q. And, um, when they were published did they sometimes
24 elicit responses and critiques in other journals?
25 A. Yes.
26 Q. So for in that sense they were reviewed by the
27 scientific community and susceptible to critique and
28 evaluation?

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1 A. Correct.
2 Q. Okay. And you also indicated that you talked with
3 people at the American Academy of Forensic Science?
4 A. Correct.
5 Q. So the issue of the appropriate statistics to be used
6 in cold hit cases was brought up at those meetings?
7 A. Yes. At least up to a year or two back.
8 Q. Okay. Their annual meetings?
9 A. Yes.
10 Q. And you say a couple of years back. You remember that
11 it was brought up?
12 A. Yes.
13 Q. Do you remember if it was brought up at any other time?
14 A. I don't think so.
15 Q. Okay. And who -- who was it that brought that issue?
16 A. Well, the American Academia of Forensic Science has a
17 session from, again, the TWGDAM or SWGDAM group, and I
18 believe it was 1999 when the cold hits became more -- more
19 frequent. The issue placed before the academia was to review

20 the standard operating procedures for the different crime
21 labs to come up with some form of uniformity of presenting
22 cold hit statistics.
23 Q. And you don't recall whose idea that was to -- to
24 address that?
25 A. I really do not know who originated that forum but it
26 was discussed. I think the -- if I remember correctly, the
27 chairperson of that decision was the FDLE, Florida Department
28 of Law Enforcement, database manager, David Coffman.

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1 Q. Now, was the scope of this investigation just to look
2 at the laboratories and find out what they were doing or was
3 the scope broader, to solicit input from statisticians in the
4 field?

5 A. There is more than taking an inventory of the different
6 laboratories standard operating procedures for statistical
7 interpretation of cold hit cases and to come up with
8 something sort of uniformity or reasoning for it.

9 Q. Have you ever done an offender database search for a
10 profile to determine somebodies identity?

11 MS. SCHUBERT: I will object to relevance.

12 MR. LYNCH: Well, this is the voir dire, your Honor,
13 and this is what he has --

14 THE COURT: I will permit it.

15 THE WITNESS: I have not done it because legally I'm
16 not allowed to.

17 MR. LYNCH: Okay.

18 Q. (By MR. LYNCH) So have you -- I understand you are not

19 allowed to do it through CODIS. Have you ever done it
20 through any other mechanism, foreign or domestic data search?

21 A. Legally I'm not supposed to have any access to any
22 offender database.

23 Q. So you have not done it?

24 A. No.

25 Q. Have you done a search through a population database to
26 find a matching profile?

27 A. Yes. I have done that --

28 Q. Okay.

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1 A. -- numerous amounts of times. And, in fact, when I'm
2 asked to review a cold case I do that as a cross checking
3 validation study.

4 Q. And that is for purposes of detecting whether or not
5 there are very close relatives or duplicate matches in the
6 population database?

7 A. Correct. When I review a database I do -- I mimic -- I
8 do an exercise that mimics searching offenders database.

9 Q. But it is not to determine identity, it is to determine
10 something else, whether there are duplicates in the database,
11 correct?

12 A. Yes.

13 Q. Besides the article we talked about at the beginning
14 here published in Forensic Science Communications co-authored
15 by yourself through the DNA Advisory Board, have you
16 published anything directly addressing the issues of cold
17 statistics in cold hit cases?

18 A. No, I have not.

19 Q. Okay. Who wrote that with you, the forensic science
20 communications --

21 A. Um, that particular article was authored by myself;
22 Bruce Budowle, B-u-d-o-w-l-e; George Carmoldy,
23 C-a-r-m-o-l-d-y, and Barney Devlin, D-e-v-l-i-n.

24 Q. Okay. Now, you indicated earlier -- I think we talked

25 about Bruce Budowle. You said he had a good working
26 knowledge of statistical issues; is that correct?
27 A. Yes.
28 Q. Is it fair to say he is not a statistician?

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1 A. He is not a statistician.
2 Q. What is Barney Devlin?
3 A. He is a statistical geneticist.
4 Q. As is Bruce Weir and George Carmoldy?
5 A. Yes.
6 MR. LYNCH: Okay. I don't have any further questions
7 for voir dire, your Honor.
8 THE COURT: All right.
9 MR. LYNCH: Thank you.
10 THE COURT: You may proceed with your examination.
11 MS. SCHUBERT: I'm assuming the Court is finding him
12 qualified.
13 THE COURT: Well, I have no suggestion that he isn't.
14 MR. LYNCH: We submit on that, your Honor.
15 THE COURT: All right. I will find him qualified.
16 THE WITNESS: Thank you.
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RESUMED DIRECT EXAMINATION

18 BY ANNE-MARIE SCHUBERT, Deputy District Attorney:
19 Q. Dr. Chakraborty, what I want to do is ask you a couple
20 of initial questions.
21 First of all, are you familiar with the two books that
22 were produced as a result of NRC I and NRC II?
23 A. Yes.
24 Q. And the first one -- I'm not going to mark this, it is
25 only a copy of mine, but the red book -- which is entitled
26 NRC I, correct?
27 A. Correct.
28 Q. And the yellow book, which is often referred to as the
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1 NRC II book?
2 A. Correct.
3 Q. And for the record, NRC book is entitled, Evaluation of
4 forensic DNA evidence?
5 A. Yes.
6 Q. And the NRC I is entitled, DNA technology in forensic
7 science?
8 A. Correct.
9 Q. Now, with respect to the NRC I committee, um, are you
10 familiar with the individuals that were on that committee?
11 A. Yes, I would say, but, um, not equally aware for all
12 committee members.
13 Q. Let me show you here what is marked as People's Exhibit
14 No. 23. If I can ask you, Doctor, if this appears to be a
15 listing of the members of the NRC I committee?
16 A. Yes.
17 Q. And with respect to those members, do you know if the
18 NRC I committee had any particular population geneticists on
19 that committee dealing with statistical issues?
20 A. Well, there are only two members in the NRC I committee
21 who used population genetics in their research.
22 Q. And who would that be?
23 A. Mary-Claire King and Eric Lander.
24 Q. Okay.
25 THE COURT: Slow down, and try those names again.
26 THE WITNESS: Mary, M-a-r-y, hyphen Claire,
27 C-l-a-i-r-e, and the last name is King, K-i-n-g. She is the
28 cancer geneticist but uses population geneticists in her

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1 research.
2 Eric Lander, although his bachelor degree is in
3 mathematics, he is a molecular geneticist, but he, in his
4 research, uses population genetic principals.
5 THE COURT: Give me that name again.
6 THE WITNESS: Lander, L-a-n-d-e-r.
7 MS. SCHUBERT: For the record, Dr. Chakraborty, I do
8 have a copy of the NRC I members up here on the overhead.
9 THE COURT: Okay.
10 THE WITNESS: Correct.
11 Q. (BY MS. SCHUBERT) Now, just if you know, Doctor, do
12 you know who Paul Ferrera is?
13 A. Yes. He is in the forensic science offices of --
14 sorry -- the State of Virginia. He is, I think, the director
15 of the division of forensic science in Virginia.
16 Q. Okay. Do you know what his -- is he a doctor or do you
17 know what his educational degree is in?
18 A. I'm not sure about his educational background, but I
19 worked with him in several committees. He was a member of
20 the DNA Advisory Board at least initially. He describes
21 himself as a forensic scientist.
22 Q. Okay. And with respect to Paul Ferrera in terms of

23 Virginia, are you familiar with whether or not they have a
24 state felon databank?
25 A. Yes.
26 Q. In terms of the level of advancement in terms of felon
27 database, how would you characterize Virginia's databank?
28 A. Well, I believe Virginia is the state where the cold

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1 hit cases were the most frequent. I think they are up --
2 until now they have more than a thousand cold hit cases.
3 Q. Okay. They have in your opinion -- as far as you know
4 there has been more than one thousand hits off of their felon
5 databank?
6 A. Correct.
7 Q. Now, in terms of other members, are you familiar with
8 George Sensabaugh?
9 A. Yes.
10 Q. Is he well known in the forensic science community?
11 A. Yes. He is very well known in the forensic science
12 community. He is a professor at University of California at
13 Berkeley. He runs a educational program in forensic
14 sciences, I believe one of the oldest in the country and, as
15 written here, he is a member of the First National Research
16 Committee and --
17 Q. How would you characterize Dr. Sensabaugh's level of
18 respect in the field of forensic science?
19 A. Well, he is more a technology person. He developed
20 some of the tools for forensic DNA typing. Um, he is very
21 well regarded.
22 Q. Okay. Now, with respect to the NRC II report, I'm
23 going to show you here People's Exhibit No. 24. I will put
24 this on the overhead here and ask you if you recognize those
25 members as being members of the NRC II committee?
26 A. Yes.
27 Q. And with respect to NRC I versus NRC II, were there
28 more or less population geneticists or statisticians on NRC

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1 II?
2 A. NRC II included more hard core population geneticists.
3 For example, the chair of that committee, Dr. James Crow,
4 C-r-o-w, he is considered to be the dean of population
5 genetics, most respected worldwide member of the committee.
6 Then the committee also includes Thomas Nagylaki,
7 N-a-g-y-l-a-k-i, from University of Chicago. He is also a
8 very well known population geneticist and more recently had
9 been involved in a number of applied --
10 Q. Applied.
11 A. -- research issues.
12 There is also included Mashatoshi Nei, N-e-i is the
13 last name, from Pennsylvania State University. He is also a
14 world leader of population genetics. He is a member of the
15 National Committee of Science. He was awarded one of the
16 most prestigious honors from Japan, I would say next to Nobel
17 Prize, in population genetics.
18 Um, then it also included the two statisticians; one
19 from University of Chicago, Steve Stigler, S-t-i-g-l-e-r. He
20 is a statistician by training, but there are many of his
21 papers which directly, um, are relevant for statistical
22 issues in DNA forensics, included among them is statistics
23 for cold hit cases.
24 David Sigmund (phonetic) is also a well known
25 statistician from Stanford University. He has written a
26 number of articles that deal with what we call multiple
27 testing, an issue that is relevant for statistics for cold
28 hit cases.

1 Q. Okay. And then with respect to the second NRC
2 committee II, Dr. Sensabaugh was on that committee as well?

3 A. Correct.

4 Q. Now, with respect to these various population
5 statisticians or geneticists, do you know most of these
6 people on a individual basis?

7 A. Yes. I know at least four of them on -- on a very
8 intimate basis. For example, I was a co-worker, colleague of
9 Mashatoshi Nei of over fourteen years. I have written more
10 than a dozen papers with him.

11 THE COURT: Who is this now?

12 THE WITNESS: Mashatoshi Nei, N-e-i. Up until 1984 --
13 '86 he was in Houston, professor in the same center where I
14 worked.

15 James Crow, although I never was with him in the same
16 institution, I know him since 1969. And in the context of
17 their work in the NRC II committee, Dr. Crow and I had
18 communications almost on a weekly basis. I supply him with a
19 lot of data analysis and give him answers to questions they
20 had in the committee.

21 Um, I know Thomas Nagylaki very well. We sub on a
22 number of NHI study sessions together. And George
23 Sensabaugh, I know him since 1989. We went to the same
24 panels on many of the forensic meetings, and I lectured in
25 his course several times.

26 Q. (BY MS. SCHUBERT) Okay. Now, with respect to the NRC
27 II committee, were you -- you mentioned that you provided
28 Dr. Crow with some of your research.

1 Was your research actually cited throughout the NRC II
2 actual book itself?

3 A. I believe that, if I'm not -- if I did not miss
4 anything, I think my research is cited twenty-six times in
5 the NRC II committee work.

6 Q. And that deals with the various statistical
7 interpretations to be utilized in forensic cases?

8 A. Correct.

9 Q. Now, we just talked a lot this morning and to some
10 extent this afternoon about cold hit cases. Um, you are
11 obviously familiar with the product rule, correct?

12 A. Yes.

13 Q. And with respect to the product rule and cold hit
14 cases, is there anything new or novel about using the product
15 rule in a cold hit case?

16 MR. LYNCH: Objection to characterization of new or
17 novel, vague. I mean, these are terms that are used in the
18 case law, and I'm concerned they are going to be --

19 THE COURT: I will permit it. You can obviously
20 clarify on cross-examination.

21 MS. SCHUBERT: Let me make it even more specific.

22 Q. (BY MS. SCHUBERT) Is there any -- any type of new or
23 novel scientific technology that is being used to employ the
24 product rule with the cold hit case?

25 A. The answer is no. But as I mentioned before, in the
26 context of cold hit cases the -- in -- instead of a single
27 question, multiple questions can be asked. So the use of
28 product rule may not be relevant for some questions but may

1 be the most appropriate way of answering for some questions.

2 Q. Okay.

3 A. There is nothing novel or new.

4 Q. Okay. Now, let me just pose a question to you. If --

5 if one were to -- if one were to have an evidence sample and
6 that is submitted to an offender databank and somebody is
7 identified through that offender databank, if we wanted to
8 know the question of what is -- how rare is the evidence
9 profiled in the human population, what would be the
10 appropriate method of statistical calculations?
11 A. I will use the product rule as it is practiced
12 according to the NRC II recommendation.
13 Q. Okay. What other -- I mean, in addition to a question
14 of how rare is the profile, what other question might one
15 ask?
16 A. For example, one could ask, since the information is
17 not available that that evidence profile has been found in an
18 offender database, we can ask the question in the database
19 that large, what is the chance of finding that profile in
20 that database.
21 Q. Okay. Is it fair to say then, Doctor, when you are
22 dealing with a cold hit off of a databank there is at least
23 two questions that could be answered. One being, What's the
24 likelihood of finding something else in the felon database,
25 correct?
26 A. Yes.
27 Q. And another question would be, How rare is the profile
28 in the whole population as opposed to just the felon

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1 database?
2 A. Yes.
3 Q. Okay. And with respect to the rarity of the profile,
4 does it make any difference whether you've -- in terms of the
5 calculations, whether it's a cold hit or if it's some other
6 type of law enforcement investigation, the identification of
7 a suspect?
8 A. No. It does not matter how the profile was found. The
9 question of rarity, how common is the profile in the
10 population does not relate -- does not relate to how the
11 profile was detected.
12 Q. Okay. Now, with -- with respect to the NRC I
13 committee, are you familiar with what the recommendation for
14 databank searches or I should say cold hits off of the
15 databank, what the recommendation of that committee was?
16 A. Yes, I'm aware of that.
17 Q. Okay. What was the recommendation under NRC I?
18 A. Their recommendation was the -- the -- the -- there
19 are -- that no statistics should be computed based on the
20 loci which were used for -- to -- to get that profile in the
21 database.
22 Q. Okay. I'm going to kind of go back and do a little
23 historical analysis. At the time the NRC I committee came
24 out, fair to say, that was in 1992?
25 A. Correct.
26 Q. At that particular time in the area of forensic science
27 were there a sufficient number of markers, DNA markers
28 available to provide identification?

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1 A. Well, the -- the markers were in works but --
2 Q. They were --
3 A. In works.
4 Q. -- in works?
5 A. In -- the -- there were sufficient number of markers
6 that were validated, but the forensic community was not using
7 all of them. So as a consequence what NRC I saw in the form
8 of what the offenders database would be using, those -- those
9 were six to eight RFLP loci, and those were not sufficient
10 for unique identification.

11 Q. So is it fair to say that at the time that NRC I came
12 out, that at that particular time there were insufficient
13 number of validated DNA markers to provide identification?

14 A. Yes.

15 MR. LYNCH: Your Honor, I'm going to object, this
16 question is leading. We are getting a lot of leading
17 questions.

18 MS. SCHUBERT: He is an expert, I can lead an expert.

19 THE COURT: I will permit the question.

20 Q. (BY MS. SCHUBERT) Is that a fair statement?

21 A. Yes.

22 Q. In terms of the NRC I -- in terms of the recommendation
23 of the NRC I committee, the database searches, in your
24 opinion, what was the reason for that recommendation?

25 A. Well, I -- I cannot read into their minds, but at the
26 same time when they were -- had the situation that there were
27 six to eight loci that are being put into offenders database
28 and there is other technology on the shelf soon to be

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1 applied, the thought that once offenders database -- once a
2 suspect is identified through the -- through the presence of
3 that profile in the databank they will be easily additional
4 markers that a forensic laboratory can type.

5 So probably their recommendation evolved from that kind
6 of reasoning, but the -- the -- they did not have the
7 opportunity to see what will be eventually put into the
8 offenders database.

9 Q. Okay.

10 A. Now, when we have now all thirteen short tandem
11 repeat --

12 Q. Thirteen?

13 A. Thirteen, one three, short tandem repeat or STR loci
14 then the structure of the offenders database has changed. So
15 I do not know if that community, same group of people were to
16 come in today, whether or not they would have stuck to the
17 same recommendation that they gave in 1992.

18 Q. Now, back in 1992 if somebody were to use the -- use an
19 offender database using six to eight RFLP markers, is it
20 possible that you can find multiple individuals in a offender
21 database that match those markers?

22 A. Well, it's hard to answer that question, for
23 example, because of the following: The -- yes, the
24 cumulative discriminatory power of those six to eight RFLP
25 loci, it's probably of the same order as that of the thirteen
26 short tandem repeat loci, but in 1992 offenders database was
27 of the size, at the most, of several thousand. So in several
28 thousand we -- with that many loci you would not have -- have

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1 any problem in the sense -- probably -- I mean, you wouldn't
2 have found a large number of coincidental matches.

3 Q. Okay.

4 A. But if the database was as big as that of today and
5 since most of the forensic laboratories were not doing all of
6 the six to eight loci, they were doing three or four --

7 Q. Okay.

8 A. You have to remember that to develop a full locus
9 profile based on our RFLP technology it would take almost a
10 month.

11 Q. Okay.

12 A. So for the sheer time investment the laboratories were
13 not doing all of the eight loci, but today thirteen short
14 tandem repeat loci can be done in less than one days worth of
15 work. So it is -- there are operational issues that were
16 also involved.

17 Q. Okay. Now, in terms of the NRC I recommendation, um,
18 of not using statistics but then going out and typing other
19 loci, um, in your opinion is that -- is that a defunct
20 method?
21 A. It's infeasible in two days work.
22 Q. Infeasible?
23 A. Yes, infeasible. To get the maximum power out of an
24 offenders database you have to -- did you get the word,
25 power, p-o-w-e-r -- of the offenders database you have to use
26 the most discriminatory and most commonly used validated
27 markers. The more the better.
28 Q. Right.

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1 A. Now, as soon as you do that, although in scientific
2 laboratories there are thousands of other markers available,
3 additional testing based on that will not be accepted in
4 forensic work until they are validated. So if we validate
5 another thirteen loci or another fourteen loci then the
6 offenders database will say, hey, now you have given us
7 validated loci that can be even more discriminatory, we can
8 make the offenders database even more powerful, we will
9 include that for inclusion of offenders data also. So their
10 suggestion of having two alternative battery of markers, one
11 for database search and another for additional testing, this
12 is not forensically, um, feasible.
13 Q. Okay. Are you aware of any -- you talked earlier about
14 the number of forensic laboratories both in the United States
15 as well as internationally that you have dealt with
16 yourself.
17 Are you aware of any forensic laboratory in this
18 country or any other country that uses the NRC I approach for
19 cold hit cases?
20 A. I do not know of any place which uses the NRC I
21 recommendation.
22 Q. Okay.
23 A. Because of it not being feasible.
24 Q. Okay. Is it, in terms of -- in terms of the scientific
25 acceptance or lack of acceptance, would you agree that it's
26 not generally accepted in the forensic laboratories to use
27 NRC I recommendations?
28 MR. LYNCH: Objection by using terms that I don't

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1 think, um, are adequately defined. Generally accepted is a
2 legal term not subject to this witness' expertise.
3 THE COURT: Well, I think it is a phrase that has some
4 common sense understanding. Generally acceptable, maybe it
5 has a technical/legal meaning that we will define, but you
6 can question him about how he interprets it. I think it is a
7 phrase that has a pretty common sense meaning. I will permit
8 it.
9 THE WITNESS: Since it is not practiced by any forensic
10 laboratory in the world I do not know how it can be generally
11 accepted, no matter how you define generally accepted.
12 MS. SCHUBERT: Okay.
13 Q. (BY MS. SCHUBERT) Now --
14 THE COURT: Let me ask a question.
15 You say this system NRC I proposed is at this point in
16 time not feasible?
17 THE WITNESS: Not feasible.
18 THE COURT: Not feasible.
19 Would you explain to me why it is not feasible to
20 proceed and examine some other loci than those that are in
21 the database process?
22 THE WITNESS: It is not feasible for the following

23 reason: Um, in locus a genetic marker can be used. In
24 forensics, if it passes through some validation test in the
25 forensic but in the hands of the forensic analysts. So in
26 order to have some genetic testing acceptable in forensic
27 science it has to go through some quality control, quality
28 assurance validation studies.

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1 THE COURT: And those have been done for the thirteen
2 or so loci that are now used?

3 THE WITNESS: Correct.

4 THE COURT: Okay.

5 THE WITNESS: Irrespective of whether or not you are
6 going to use those loci for creating your offenders database
7 or for doing casework, the -- we have literally hundreds of
8 thousands of genetic markers that can be typed but only all
9 together maybe twenty-five loci had been validated for
10 forensic work. Of those twenty-five loci the technology used
11 for the first six to eight loci are now obsolete. RFLP loci
12 are time consuming, it takes a lot of good quality DNA, a lot
13 of time more -- um, I would say ninety-nine percent of the
14 laboratories in this country has disbanded the RFLP
15 technique.

16 Then came the six loci polymarker and DQalpha which had
17 very limited discriminatory power. So those were also gone
18 within that time. Nobody practices them anymore. So what is
19 left out of the validated loci are the thirteen short tandem
20 repeat loci. Since these are validated, these are in
21 combination, they are the most efficient set now so they are
22 being used for offenders database so that you don't have to
23 go through a large number of coincidental matches.

24 Q. (BY MS. SCHUBERT) What does that mean, if you can
25 explain that?

26 A. Well, just for arguments sake, suppose the frequency of
27 a profile is 1 in 100,000. So if your offenders database
28 gets larger than 100,000 simply by coincidence you can get

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1 one or more hits. So when you have multiple hits then you
2 have to go through each one of them through further
3 investigations as to whether or not that person was out on
4 the street or sitting in the jail or whether or not he was on
5 probation, being on 24 hours watch by law enforcement
6 authorities, this type of interrogation you have to go
7 through.

8 Now, if you have multiple coincidental matches for each
9 one of them you have to go through that routine before
10 bringing that person into the picture in relation to the
11 crime you are investigating. So in order to have the maximum
12 use of offenders database you have to have as many loci to be
13 included in the database and each locus has to be
14 discriminated.

15 Q. So provide uniqueness?

16 A. To provide --

17 Q. Source attribution?

18 A. -- source attribution or uniqueness.

19 Q. Meaning if you had a hit off of the databank you could
20 be confident that that individual was a source of the --

21 A. Right. Now, once you have utilized all of your
22 validated loci then there is nothing left for doing
23 additional testing. Now --

24 THE COURT: Because there are not available additional
25 validated loci?

26 THE WITNESS: Correct.

27 THE COURT: Okay.

28 Q. (BY MS. SCHUBERT) And with respect to just casework,

1 you know the difference between casework testing versus felon
2 databank? In casework a laboratory may use nine or thirteen
3 S.T.R. loci, correct?
4 A. Yes.
5 Q. And in your felon databanks we use nine or thirteen
6 loci, correct?
7 A. Correct.
8 Q. Is it fair to say that across this country in accord
9 with CODIS laboratories all use these same thirteen loci?
10 A. Yes.
11 Q. And is it also fair to say that the same thirteen loci
12 are used for casework analysis as well?
13 A. Correct.
14 Q. Now, in terms of the NRC I recommendation, would you
15 agree that it's scientifically -- that recommendation is
16 scientifically outdated based on current technology?
17 A. Yes.
18 Q. Okay. Now, you had mentioned that in terms of the --
19 the old systems that we had, RFLP, that one of the reasons
20 why it -- that it's not feasible is because you have to have
21 a large amount of DNA to test, correct?
22 A. Yes.
23 Q. And the power of discrimination is not as good as
24 S.T.R.s?
25 A. Yes.
26 Q. Okay. And with P.C.R. -- with DQalpha and polymarker,
27 again, the power of discrimination is very limited in
28 comparison to S.T.R.s?

1 A. Correct.
2 Q. If -- well, let me ask you this: Are you aware of
3 anybody that was on the NRC I committee, the members here
4 that we talked about -- this would be People's, I think,
5 23 -- are you aware of anybody on the NRC I committee that
6 continues to hold the position that NRC came out with, with
7 respect to cold hit cases?
8 A. Well, I --
9 MR. LYNCH: Objection --
10 THE WITNESS: I cannot answer that question myself,
11 although in the context of these cases I have been shown
12 declaration by some members, but I -- it would be difficult
13 for me to say -- answer what their current position is.
14 Q. (BY MS. SCHUBERT) Okay. Well, let me ask you this:
15 You are familiar with Paul Ferrera from the Virginia State
16 databank?
17 A. Yes.
18 Q. And you mentioned earlier that as far as you know
19 Virginia's had over one thousand cold hits?
20 A. Correct.
21 Q. Are you aware of whether or not Virginia follows the
22 recommendation of the NRC I committee?
23 A. My answer is no. The reason that I give that answer is
24 I have seen the standard operating procedure of Virginia
25 laboratory of which Paul Ferrera is the director.
26 Q. Okay.
27 A. So obviously a director should -- cannot be in a
28 position contrary to the statements in the standard operating

1 procedure of his laboratory. The statistics part of his SOP
2 says that for answering the question of rarity of the
3 profile, irrespective of whether that profile was detected
4 from offender database, they use the modified product rule.

5 Q. Okay. Now, in terms of -- in terms of answering the
6 question of how rare is the profile, does it make any
7 difference, Doctor, whether or not you determine that profile
8 through a cold hit or some other law enforcement technique?
9 A. It -- in my opinion it does not matter.
10 Q. Why is that?
11 A. Because you are asking the question how rare the
12 profile is.
13 Q. Okay.
14 A. And the answer of that question is to be given by using
15 a formula that says that what -- what is the frequency of
16 combination of those ideals in an individual out in the
17 population as is the product rule answer.
18 Q. Now, when you testified previously as an expert in
19 these cases where you reviewed the 250-plus cases, what
20 question have you been answering with respect to providing
21 statistical calculations?
22 A. Most of the time the question -- I mean -- I have to
23 qualify it because not all 250 cases were similar. Some were
24 mixtures, some were divorce parentage. So when the question
25 of rarity of a single donor DNA evidence sample was in -- was
26 the issue, my recommendation was to use the product rule.
27 Q. Okay.
28 A. With adjustment for hidden population substructure in
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1 the database.
2 Q. Okay. That's something that is factored into the
3 product rule?
4 A. Right.
5 Q. And that is what is the standard operating procedure of
6 forensic laboratories?
7 A. Yes.
8 Q. Okay. Now, if -- if one were to -- if the forensic
9 community was to adopt the recommendation of NRC I, what
10 their recommendation was with respect to cold hits, what
11 impact would it have on these felon databases?
12 MR. LYNCH: Objection, relevance. The impact on the
13 felon database isn't relevant under Kelly or any other cases.
14 THE COURT: What is the relevance of that?
15 MS. SCHUBERT: Well, it's relevant to establish that if
16 you follow the recommendation that -- that, um, no cold hit
17 case could proceed in this country.
18 MR. LYNCH: Well, I dispute that. But the point is
19 this is an ends justifying the means kind of argument, and
20 Kelly in no way adopts that or requires that to be the case.
21 If it becomes infeasible because of what the scientists
22 recommend or generally agree to, then it becomes infeasible,
23 but I don't think it would. But the point being, this line
24 of questioning is irrelevant under Kelly or 352 or anything.
25 THE COURT: Well, it has -- it may be a marginal issue,
26 but I'm going to permit the testimony.
27 Q. (BY MS. SCHUBERT) Does that make sense, Doctor?
28 A. Well, you asked what impact would it have in the

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1 context of use of offenders database.
2 Q. Yes.
3 A. Well, if we were to follow NRC I since there is no
4 valid -- no additional validated loci that can be tested in
5 today's platform in most of the laboratories you cannot
6 present any statistics.
7 Q. Okay. Now, with respect to the NRC II recommendation,
8 with respect to cold hit cases, can you tell us what the

9 recommendation was of NRC II?
10 A. Well, essentially there are -- the -- the
11 recommendation in NRC II was to address another question that
12 is -- that could be raised in the context of the cold hit
13 scenario. Given that the profile is found in one -- one
14 individual in the offenders database there inlays the
15 question, what is the likelihood of finding such a profile in
16 a database that large.
17 Q. So let me make sure I have this correct. With respect
18 to the NRC II recommendation, it's your opinion that they are
19 addressing the question of what is the likelihood of finding
20 another person in the felon database as opposed to the rarity
21 of the profile?
22 A. No. They are asking the question, what is the chance
23 of finding this profile in the database this large that has
24 been searched through.
25 Q. Meaning a felon database?
26 A. Right.
27 Q. Okay. In your opinion, were they addressing -- the
28 statistical calculations they provided, was that addressing

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1 the question of how rare is the profile in the human
2 population?
3 A. No, they were not addressing that question.
4 Q. Okay. And you mentioned to us earlier today that you
5 were on the DNA Advisory Board, correct?
6 A. Correct.
7 Q. And you mentioned some of the individuals that you
8 worked with with respect to the DNA Advisory Board, and I
9 think Mr. Lynch showed you an exhibit. Here, this is Defense
10 Exhibit pretrial V, as in Victor. This particular
11 publication from Forensic Science Communication, this was a
12 result of a DNA Advisory Board, correct?
13 A. Yes.
14 Q. And you mentioned earlier that you had co-wrote this
15 statistical population evaluation along with Dr. Carmoldy?
16 A. Dr. Carmoldy, Barney Devlin and Bruce Budowle.
17 Q. Okay. Would you agree that Dr. Carmoldy is a well
18 known population geneticist in the field of forensic science?
19 A. Yes.
20 Q. And you also mentioned Dr. Devlin, he is also well
21 known?
22 A. Yes.
23 Q. And Dr. Budowle, while not a population geneticist,
24 has, in your opinion, a sufficient understanding of the
25 statistical issues?
26 A. Yes, at least for twelve years.
27 Q. Okay. And you have written articles with Dr. Budowle?
28 A. Yes.

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1 Q. Those articles deal with statistical interpretation?
2 A. Yes. At least half of those twelve articles deal with
3 statistical issues.
4 Q. Okay. Now, I want to -- before I go back to what the
5 specific recommendation was out of the DNA Advisory Board,
6 I'm going to show you an exhibit which is People's Exhibit
7 No. 21. I'm going to put this on the overhead here and ask
8 you if you recognize this particular document here?
9 A. Yes.
10 Q. What is this?
11 A. Well, the -- as I was saying before, that towards the
12 end of the life of the DNA Advisory Board there was another
13 national commission created called National Commission of
14 Future of DNA. Since they were interested in the

15 recommendations of DNA Advisory Board, as DNA Advisory Board
16 was finishing their deliberations on certain defined topics
17 we were -- we had meetings with the members of the National
18 Commission Future of DNA on a frequent basis.

19 So this is the proceedings of that public meeting held
20 jointly with the National Commission of Future of DNA after
21 we finished our deliberations, our recommendations, our
22 statistical issues in cold hit search cases.

23 Q. Okay. Now, I want to use this particular page. Is it
24 fair to say that this document, People's 21, is a public
25 disclosure of what occurred during the proceedings of the DNA
26 Advisory Board in April of 2000?

27 A. Correct.

28 Q. And it involves a power point presentation?

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1 A. From the chair of the DNA Advisory Board in front of
2 the Commission of Future of DNA.

3 Q. Okay. I want to ask you with respect to this
4 particular first page of People's 21, does that list out the
5 various members of the DNA Advisory Board?

6 A. Towards -- yes. These are the members that were
7 currently serving at the time of that public meeting.

8 Q. Okay. Now, just correct me if I'm wrong, in terms of
9 being on a DNA Advisory Board, was that something you applied
10 for or were asked to be a member?

11 A. We were asked to be a member. I was a nominee for that
12 advisory board from, um, American Society of Human Genetics.

13 Q. Okay.

14 A. So I represented American Society of Human Genetics as
15 an expert to sit on the DNA Advisory Committee.

16 Q. I want to briefly go through this. In terms of the
17 members of the DNA Advisory Board there is, one, Dr. Arthur
18 Eisenburg. What is his, if you know, occupation?

19 A. He is, by training, a molecular geneticist, but he has
20 researched throughout his life dealing with forensic issues.
21 He use to be with a private DNA testing laboratory initially
22 and then for over ten years he's been an associate professor
23 at University of North Texas in Fort Worth. He runs a
24 paternity testing laboratory, and he has created several
25 forensic population databases.

26 Q. Okay. Now, there is also here the second one, which is
27 hard to read, but Honorable --

28 A. Abrahamson. She is the Supreme Court Justice in the

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1 State of Wisconsin.

2 Q. Okay. There is also here Dr. --

3 A. Dwight Adams.

4 Q. -- Dwight Adams.

5 A. He -- Dr. Adams has a Ph.D. in chemistry. He is a
6 forensic analyst, and I think currently he holds a senior
7 position in one of the FBI casework laboratories.

8 Q. How about Dr. Fred Barber (phonetic)?

9 A. Fred Barber is a medical geneticist, but he, for the
10 last eight or ten years, has been doing research in
11 statistical issues in DNA forensics. Currently he is a
12 member of the RCMP DNA Advisory Board in Canada as the
13 population geneticist.

14 Q. And that -- you mean the RCMP, the Canadian --

15 A. US CODIS.

16 Q. Okay. And then Dr. Budowle is with the FBI?

17 A. Correct.

18 Q. And obviously yourself. Then Dr. David Coffman, who is
19 he?

20 A. He is a forensic analyst. He was in charge of the

21 FDLE, Florida Department of Law Enforcement, CODIS database.
22 Q. Okay. And then there is Dr. Devlin.
23 A. Barney Devlin. As I mentioned before, Barney is a
24 statistical geneticist by training, has written a number of
25 articles on statistical issues of DNA forensics, and he is
26 also a co-author of the technical report that summarizes
27 DAB's recommendations.
28 Q. And Dr. Marcia Eisenberg?

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1 A. She is a technical leader in the laboratory called
2 Labcor, L-a-b-c-o-r, it is a large paternity testing
3 laboratory. Also, they do some forensic casework, and she
4 is -- she has a Ph.D in molecular genetics.
5 Q. And we talked about Dr. Ferrera and then Mary --
6 A. Gibbons.

7 Q. Mary Gibbons. Do you know who that is?
8 A. I truly do not know her background, but from the
9 comments she use to make on issues that she use to raise in
10 the advisory board it sounded like her expertise is in the
11 area of bioethics.
12 Q. Bioethics. Then there is Eric --
13 A. Juengst.
14 Q. -- Juengst.
15 A. J --
16 Q. Juengst.
17 A. Okay. Eric is the bioethecist (phonetic).
18 Q. Bioethecist?
19 A. Yeah. He has -- his Ph.D degree is in either sociology
20 or psychology, but his research involves privacy issues of
21 genetic testing.
22 Q. Okay. And then you have --
23 A. Susan Narverson.
24 Q. Do you know who that is?
25 A. Yes. Susan Narverson she is -- yes. She holds a
26 senior position in the Department of Public Crime Laboratory
27 in Arizona. I think she describes herself as a forensic
28 analyst.

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1 Q. Okay. And then the other one, Dr. -- Mr. Larry --
2 A. Larry Presley (phonetic). He is also a member of one
3 of the FBI laboratories. Although he was a co-author of a
4 number of database papers his expertise is, again, in
5 forensic science.
6 Q. Okay. And then how about Dr. Reeder -- is that Reeder?
7 A. Dennis Reeder. Dennis Reeder, he has a Ph.D in
8 biological chemistry. He was the scientific leader of the
9 National Institute of Standards DNA Laboratory until very
10 recently.
11 Q. Uh-huh.
12 A. So he helped in validating the technology of DNA type
13 as used in DNA forensics under the platform of RFLP
14 polymarkers and S.T.R.s. Under his direction a lot of
15 quality control, quality assurance materials were designed
16 that are in use. Currently he holds a similar research and
17 development position with Applied BioSystems, the commercial
18 company which produces instrumentation kits for forensic use.
19 Q. Kits. And the last one, Dr. Mohammed Tahir?
20 A. He is a senior member of a laboratory in Indiana State
21 doing forensic testing. He would describe himself as a

22 forensic analyst, although his degree is in molecular
23 genetics. He has a Ph.D degree.

24 Q. Okay. Now, with respect to the individuals on the DNA

25 Advisory Board, setting aside yourself, would you
26 characterize the other members of the DNA Advisory Board to
27 be well versed in their particular fields of study?
28 A. I would say so, yes.

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1 Q. Okay. And with respect to the population geneticists
2 such as Dr. Carmoldy --

3 A. Dr. Carmoldy was not a member of the DNA Advisory
4 Board. At the time -- this is the list of members in the
5 later half of the life of the DNA Advisory Board, 1998
6 through 2000.

7 Q. Okay.

8 A. And at that time Carmoldy was a population geneticist
9 of the RCMP DNA Advisory Board.

10 Q. Okay.

11 A. So since we -- we had only two flag-carrying population
12 geneticists in the DNA Advisory Board we -- in the
13 subcommittee we invited George Carmoldy to provide input as
14 to what the Canadian analog of CODIS were -- would be
15 recommending.

16 Q. Okay.

17 A. So that particular technical piece that you have seen
18 before was co-authored by a subcommittee of the DNA Advisory
19 Board with George Carmoldy as our invited outside member.

20 Q. Okay. Now, with respect to the recommendations that
21 were made by the DNA Advisory Board under People's -- I'm
22 sorry -- Defense Exhibit V, I'm going to show you here page
23 5.

24 THE COURT: While we are going through that, since we
25 are starting here in a new direction, let's take our
26 afternoon break. It's ten to 3:00, we will take a 15-minute
27 recess. Please return at that point.

28 (Recess.)

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1 CERTIFICATE OF CERTIFIED SHORTHAND REPORTER

2 State of California)
) ss.

3 County of Sacramento)

4 I, Burgundy B. Henrikson, hereby certify that I am a
5 Certified Shorthand Reporter and that I recorded verbatim in
6 stenographic writing the proceedings had Monday, December 30,
7 2002 in the matter of the People of the State of California
8 versus Paul Eugene Robinson, Defendant, Case Number 00F06871,
9 completely and correctly to the best of my ability; that I
10 have caused said stenographic notes to be transcribed into
11 typewriting, and the foregoing pages 700 through 734 and 774
12 through 812 constitute a complete and accurate transcript of
13 said stenographic notes taken at the above-mentioned
14 proceedings.

15 I further certify that I have complied with CCP
16 237(a)(2) in that all personal juror identifying information
17 has been redacted if applicable.

18 Dated: Monday, December 30, 2002.

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Burgundy B. Henrikson, CSR No. 11373

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1 ---o0o---
 2 (Proceedings resumed after reporter switch
 3 and an afternoon break.)
 4 ---o0o---
 5 THE COURT: All right. The record will show all parties
 6 are present, our witness has resumed the witness stand. Have
 7 we turned on his microphone? I think so.
 8 THE WITNESS: Yes.
 9 THE COURT: Yep. You're on the air. Let us continue.
 10 Q (By MS. SCHUBERT) Now I'm going to show you again,
 11 Doctor, Defendant's Exhibit V, which is the DAB Statistical and
 12 Population Genetic Issues Regarding the Evaluation of
 13 Frequencies of Occurrence of DNA Profiles Calculated for
 14 Pertinent Population Databases. And I'm showing you page 5 of
 15 that document. You recognize at least this paragraph here
 16 entitled database searches?
 17 A Yes.
 18 Q Can you tell us what -- did you have a role in drafting
 19 this terminology of the database search?
 20 A Yes.
 21 Q And with respect to this particular DAB recommendation,
 22 can you tell us what that was?
 23 A Essentially this is a clarification of the NRC-2
 24 recommendation. NRC-2 recommendation was in order to make it
 25 simple they left out certain phraseologies that made their
 26 recommendation somewhat ambivalent.
 27 MR. LYNCH: Objection, your Honor. This is speculation.
 28 This witness is testifying to things he can't possibly know as

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1 to what they left out, what they included, and what their
 2 reasoning was.
 3 THE COURT: He can tell us what his impression is of what
 4 they presented, so he's entitled to do that.
 5 THE WITNESS: For example, when they said that the --
 6 when a DNA profile is identified to a database search the
 7 computation has to be modified. That is a statement. It never
 8 said what computation and for what purpose.
 9 Q (By MS. SCHUBERT) Okay.
 10 A Clearly they were -- they had in mind, as is there in
 11 small letters on the same page in the report they were
 12 addressing a question that what is the probability of finding
 13 such a DNA profile in the database searched.
 14 Q Okay. And I'm going to show -- I'm just going to show
 15 the page -- what page are we talking about of the NRC-2?
 16 A I think NRC-2 talks about that on --
 17 Q This 161, is that fair? I'm going to specifically show
 18 you page 161 here. And this is my working copy, so disregard
 19 all the markings, but under recommendation 5.1 --
 20 A Right.
 21 Q -- would you agree that this was the recommendation
 22 dealing with database searches?
 23 A Yes. When the suspect is found by a search of DNA
 24 database, the random match probability should be multiplied
 25 by N --
 26 THE COURT: You got to slow down. When you start reading
 27 then you go awfully fast. So would you try that slowly.
 28 THE WITNESS: The recommendation 5.1, namely when the

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1 suspect is found by a search of DNA databases, the random match
 2 probability should be multiplied by N, the number of persons in

3 the database. Now when they make that recommendation, they
4 left out what question is answered by that formula or
5 recommendation. Obviously they were not answering the question
6 of random match probability. They were in fact answering the
7 question what is the probability of finding such a DNA profile
8 in the database.
9 Q (By MS. SCHUBERT) Meaning the felon database?
10 A Felon database.
11 Q Okay.
12 A So they were not addressing the question of rarity. So
13 in the first sentence before recommendation 5.1, namely if the
14 suspect is identified through a DNA database search, the
15 interpretation of the match probability and likely ratio given
16 in chapter four should be modified, that has to be interpreted
17 or taken into consideration with respect to the question being
18 answered.
19 Q Okay.
20 A Now as I said before, what is written on this subject
21 does not specify the differences -- does not make distinctions
22 of the different questions that could be posed in the context
23 of a cold hit case.
24 Q Okay. So with respect to this particular recommendation,
25 first of all, when it talks about a suspect is found by a
26 search of a DNA database, the random match probability should
27 be multiplied by the number of people in the database, is
28 that -- when you talk about random match probability is that

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1 the product rule?
2 A Right.
3 Q Okay. And this -- in your opinion, Doctor, this
4 recommendation is addressing the question of what's the
5 likelihood of finding another person in the felon database?
6 A Correct.
7 Q So it does not address the question of what is the rarity
8 of the DNA profile in the general population?
9 A Yes.
10 Q And when you've testified as an expert regarding the
11 statistical significance of a DNA match, which question have
12 you addressed?
13 MR. LYNCH: Objection. Vague. In which situation are we
14 talking about, a cold hit case?
15 THE COURT: All right. Clarify it.
16 Q (By MS. SCHUBERT) Well, let me ask you this, does it
17 make any difference whether it's a cold hit case or a non-cold
18 hit case on the rarity of the profile?
19 A In fact, my testimony was very specific about the
20 question being answered. I asked -- when I was asked about
21 give me the statistical interpretation, I in turn used to ask
22 what is the question that you consider relevant. I can answer
23 each one of them. For example, if you ask me the question of
24 rarity, I will use the product rule with the usual adjustment
25 of population substructure and say this profile is expected to
26 be found in such-and-such population with a frequency no more
27 than this.
28 Q Okay.

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1 A I would use the product rule. Then I would ask well,
2 since you presented me information that this profile was
3 initially found by a searching a database, then I can answer
4 another question; namely, I can also answer the question based
5 on the computation that I have already done for match
6 probability. I could also answer the question what is the

7 chance of finding such a profile in a database that large.
8 Q A felon database?
9 A Correct.
10 Q Okay.
11 A Third, I could turn around and answer that question in
12 terms of likelihood ratio, although I would be very careful
13 about how you interpret my statistics. Otherwise, the
14 statistics may be right but the English translation of it would
15 be wrong. Namely, I would say that I could consider two
16 scenarios and I can then say that the observation that this
17 evidence sample matches a profile in a felon database out of
18 that many individuals, I can turn that into a likelihood ratio
19 and say this observation is so many times more likely to occur
20 under scenario one as opposed to scenario two.
21 Q Okay.
22 A But don't change any word of that statement. Otherwise,
23 I would fall into a fallacy that in legal context called
24 prosecutor fallacy --
25 Q Okay.
26 A -- which is often done. Including some of the experts
27 who have written on this subject.
28 Q In this particular case?

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1 A Right.
2 Q Okay.
3 A So there are -- what I'm saying is there are several
4 alternative questions that can be asked, and the answers
5 obviously are different.
6 Q Now --
7 A The four or five or half a dozen papers that have been
8 cited in the context of today's discussion, none of them except
9 the DAB recommendations clearly mentions what questions are
10 being answered by what formula. This is nothing wrong with
11 this formula. This formula are simply answering different
12 questions.
13 Q Okay. Now if you were to answer -- if the question to be
14 posed was what's the likelihood of finding another person in
15 the felon databank that matches, would you agree that the
16 recommendation of NRC-1 -- or NRC-2 is a correct
17 recommendation?
18 A Yes.
19 Q If you were to pose the question of how rare is the
20 profile, the evidence profile, would you agree that the product
21 rule is the appropriate method?
22 A Right. What they refer to is the random match
23 probability.
24 Q Just in terms of the practicalities of an actual case
25 work --
26 THE COURT: Just a second. The phrase you used is random
27 match probability?
28 THE WITNESS: Correct.

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1 THE COURT: Okay.
2 Q (By MS. SCHUBERT) That is the same -- the equivalent of
3 what's the product rule, correct?
4 A Yes.
5 Q When you say random match probability, how does that --
6 what does that mean this terms of laymen's terms?
7 A This profile is no more common than one in such-and-such
8 individuals out in the population.
9 Q Like, for instance, if hypothetically -- and I'm just
10 going to put this number out here -- let's say in a particular

11 sexual assault case the statistical calculation of the evidence
12 profile is one in 650 quadrillion of the African American
13 population, what does that mean in terms of laymen's terms?
14 A In laymen, I would state that in English as follows:
15 This 13 locus profile is expected to occur in African American
16 population with a frequency no more common than one in
17 600 quadrillion, or whatever the number was --
18 Q Okay.
19 A -- expected to occur. That is because I have used some
20 assumptions that are validated. I used the phrase "no more
21 common," meaning that I have taken care of some degree of
22 reasonable conservativeness and, third, I use the word
23 "expected" to reflect that it by no means implies that there
24 will be so many real individuals of the same population
25 description we're stating.
26 Q Now with respect to forensic DNA cases, is it with
27 statistical -- when statistical calculations are provided are
28 they provided based on the evidence or are they provided based

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1 upon the suspect?
2 A They're based on the evidence.
3 Q Okay.
4 A Because we know that that is the profile of the
5 defendant.
6 Q Okay.
7 A If we look at the suspect's profile.
8 Q Okay. But in terms of the statistical calculation, would
9 you agree that the statistics are provided based on the
10 evidence profile?
11 A Correct.
12 Q And is that a common practice of all forensic
13 laboratories?
14 A Yes.
15 Q Does the rarity of the profile, the evidence profile, say
16 the sperm fraction, does the rarity of that profile change
17 whether it's a cold hit case or a non-cold hit case?
18 A No, it does not.
19 Q Now I'm going to go back here again to show you
20 People's 21, which is the proceedings from the DNA Advisory
21 Board and ask you on page 10 of 14 this particular slide here,
22 do you recall discussions at the DNA Advisory Board about the
23 topic of database searches?
24 A Correct.
25 Q And can you just tell us what are some of the -- what is
26 this addressing here?
27 A As the other document from the DNA Advisory Board
28 mentions, this is rephrasing the two questions. In the context

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1 of database search we can ask alternative questions two of
2 which are as follows: One is what is the rarity of the DNA
3 profile; how -- with what frequency is expected to occur in the
4 population. And it can be addressed by the logic of random
5 match probability; namely, the product rule.
6 The second question, alternatively, is what is the
7 probability of finding such a DNA profile in the database
8 searched. Felon database. There we decided in the DNA
9 Advisory Board the recommendation would be to adopt NRC-2
10 recommendation 5.1; namely, the random match probability should
11 be multiplied with the size of the felon database.
12 Q Now just to give a fairly simple example, if we were to
13 have a felon database of say 30,000 people in that -- 30,000
14 convicted felons in that databank, and you had an evidence

15 profile in there and it matches to say some convicted felon,
16 would you agree that NRC-2 recommendation is what's the
17 likelihood of finding someone in those 30,000 convicted felons
18 that would match the DNA profile?
19 A Correct.
20 Q Okay. As opposed to the first question, the rarity of
21 the profile in the entire human population; is that correct,
22 the rarity of the profile?
23 A Yes.
24 Q Okay. And that --
25 A Instead of answering that for the entire human
26 population, we divided the human population by major
27 population -- population groups relevant for this country;
28 namely, European Americans, African Americans, Hispanics, and

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1 gave different the numbers based on each of the subpopulation
2 database.
3 Q Okay. And with respect to the NRC-2 committee, would you
4 agree that they recommended using the product rule using those
5 three major racial groups for forensic DNA cases?
6 A For answering the first question; namely, the rarity.
7 Q Okay. Now -- okay. Now Dr. Chakraborty, in terms of
8 your experience with dealing with the 60 CODIS labs that you
9 talked about within this country as well as the international
10 analog equivalent of CODIS labs, what is the practice of the
11 forensic laboratories when there's been a hit off the felon
12 databank in terms of the statistical calculation?
13 A The reports that I have seen, most of them you give
14 the only -- answer only the first question; namely, the rarity.
15 In some court cases I have seen answers of in addition to the
16 rarity question the second answer to the second question also.
17 Q Okay. But in terms of if we were to present evidence to
18 a jury of a crime scene sample and the profile that matches
19 that crime scene sample, if you were to present to the jury
20 what is the rarity of the particular profile, the evidence
21 profile, which particular statistical calculation would you
22 use?
23 A The random match probability.
24 Q Okay. And would you agree that when that question is
25 posed, that the forensic laboratories, whether they're within
26 the United States or internationally, all agree that the
27 product rule is the appropriate method to use to answer that
28 question?

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1 A Yes.
2 Q Are you --
3 A I would -- only just for the sake of future reference to
4 my answers, I would use the word modified product rule; namely,
5 product rule imbedded into that is reasonable adjustment for
6 population substructure.
7 Q Okay. That's what all forensic laboratories use?
8 A Right.
9 Q Okay. When we talk about the product rule, we're
10 assuming there's been a correction to a -- account for the
11 possibility of substructure?
12 A Correct.
13 THE COURT: Do we call that -- "we" is the wrong word.
14 Do you call that the modified product rule?
15 THE WITNESS: I call it modified product rule.
16 THE COURT: Okay.
17 Q (By MS. SCHUBERT) In this particular case you had an
18 opportunity to review the statistical calculations provided in

19 the Deborah Lamar case, correct?
20 A Yes.
21 Q And was what you call the modified product rule used?
22 A That's the one they used, yes.
23 Q And is that the same type of product rule that you
24 testified in the Soto case?
25 A Yes.
26 Q Okay. As well as the -- I'm not sure if you testified to
27 that in Vanegas, but you did in Soto, correct?
28 A Yes. Although I should mention that the exact formula

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1 used in the Soto case used a substructure adjustment somewhat
2 different from the calculations that the laboratory did in this
3 particular case. And that was necessitated by the fact that
4 Soto case dealt with the RFLP loci and here we are dealing with
5 STR loci.
6 Q Okay. But fair to say in both Soto and in this case
7 there was an accounting for the possibility of substructure?
8 A Correct.
9 Q And that was deemed the modified product rule?

10 A Correct.
11 Q Now you mentioned, just to be more specific, that there
12 are several European countries that have felon databanks,
13 correct?
14 A Yes.
15 Q And is one of those England?
16 A Yes.
17 Q How would you characterize the number of hits that the
18 English databank has gotten using a felon databank?
19 A I do not know of the exact number, but that's an order of
20 magnitude larger than the cold hit encounters in U.S. That's
21 because the English offenders database includes the database on
22 suspects also.
23 Q Okay.
24 A As a consequence, many of their cold hit cases are from
25 burglaries and the demography says that while for sexual
26 assault cases the one-third of the offenders are repeat
27 offenders, but in burglary cases more than 65 percent of the
28 offenders are repeat offenders.

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1 Q Okay.
2 A So obviously they get many more cold hits from burglary
3 cases because they include suspects in addition to offenders.
4 Q Okay.
5 THE COURT: I'm not sure I followed this. You say in
6 burglary cases, you mean are persons with a history of burglary
7 included in their database; is that what you're indicating?
8 THE WITNESS: Yes.
9 THE COURT: But they're still -- they are still, even
10 though they've included people with burglaries these are cases
11 I assume commonly of some kind of sexual assault.
12 THE WITNESS: Not all. In fact, more than two-thirds of
13 their database is from past history of burglary, not
14 necessarily sexual assault.
15 THE COURT: Okay. But that's -- that's their database?
16 THE WITNESS: Correct.
17 THE COURT: But -- okay. All right. I think I follow.
18 Q (By MS. SCHUBERT) I guess the point that I was trying to
19 ask, Doctor, is it fair to say that the felon databank in
20 Europe has many more cold hits than the databanks in the United
21 States?

22 A Yes.
23 Q Okay. And in terms of if there was a hit off the felon
24 databank in Europe, would the statistical calculation be by
25 means of the product rule?
26 A In answering the question of rarity, yes, it is the
27 product rule.
28 Q Okay. You mentioned before that you've had an

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1 opportunity to review cold hit cases?
2 A Yes.
3 Q And the statistical calculations utilized in cold hit
4 cases?
5 A Yes.
6 Q And have you reviewed the reports generated by forensic
7 laboratories as to the significance of the DNA match?
8 A Yes.
9 Q And those laboratories utilized which statistical
10 calculation?
11 A Well, in the -- in European laboratories their standard
12 operating procedure mentions that depending upon the court's
13 need to answer the question of rarity as well as likelihood of
14 finding this match in our felon database and the logics are
15 essentially NRC-2 recommendations; namely, random match
16 probability for the first and random match probability
17 multiplied by the database size is the second.
18 Q Okay. Now in terms of random match probability --
19 THE COURT: You were just telling us about European --
20 THE WITNESS: European.
21 THE COURT: -- European laboratories and databases?
22 THE WITNESS: Correct.
23 Q (By MS. SCHUBERT) Now with respect to those in the
24 United States, you've worked with obviously a number of people
25 that are on the -- of larger jurisdictions such as Florida,
26 correct?
27 A Yes.
28 Q Virginia?

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1 A Yes.
2 Q New York?
3 A Yes.
4 Q Any other larger metropolitan areas?
5 A King County. Seattle.
6 Q In terms of your knowledge of state felon databanks,
7 which states have had the most success of hits off their
8 databank?
9 A Virginia.
10 Q Okay. Then what -- if you had a pecking order of what
11 you know to be the more common ones.
12 A I think the next one is Florida, unless Minnesota has
13 exceeded Florida. Minnesota is the fastest -- the most common
14 three states are Virginia, Florida, and Minnesota.
15 Q And with respect to the statistical calculations once
16 those cold hits have been made, would you agree that the
17 standard practice in assessing the rarity of the profile is to
18 use the product rule?
19 A Correct.
20 Q Have you been able to assess what the position of the FBI
21 is with respect to cold hits?
22 A FBI laboratory uses the SWGDAM recommendation; namely,
23 the answer I mean routinely the rarity question.
24 Q Okay. With respect to Defendant's Exhibit V, going back
25 to this database search topic, specifically you address the

26 questions of -- two questions arise when a match is derived
27 from a database search. One, what the rarity of the DNA
28 probative; and two, what is the probability of finding such a

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1 DNA profile in the database searched. You agree that they
2 addresses different issues?
3 A Yes.
4 Q And would you agree that obviously -- that they're
5 obvious, but the first question, the rarity of the profile,
6 addresses the random match which is often of particular
7 interest to the fact finder; is that a fair statement?
8 A That's what we wrote, and it is up to the court to decide
9 what the fact finders want in the case.
10 Q Okay. Okay. Now if you were to hypothetically have a
11 cold hit on a databank and match it to a particular convicted
12 felon, then you subsequently discover say additional cases that
13 he's linked to by DNA analysis, should there in your opinion be
14 any modification of the rarity of the profile?
15 A Absolutely not. No.
16 Q And why not?
17 A Because the rarity does not change. Rarity of a given
18 profile does not change depending upon how the profile was
19 encountered.
20 Q So, for instance, my DNA profile doesn't get more or less
21 rare just because you found me through a database versus
22 finding my saliva on the sidewalk?
23 A Correct. Rarity does not change.
24 Q Okay. Is there any -- as far as you know, is there any
25 scientific support for the position that somehow you must
26 modify statistics on subsequent cases identified?
27 A Statistics is a tool to answer a question. If you change
28 the question, obviously the tool will change. You don't use a

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1 safety pin to put a nail on a --
2 Q Say that again, you don't use a what?
3 A You don't use a safety pin. Safety pin.
4 Q Sefapeel (phonetic)?
5 THE COURT: Safety pin.
6 MS. SCHUBERT: Safety pin. Sorry.
7 THE COURT: The ones you used to use on diapers.
8 MS. SCHUBERT: All right.
9 THE WITNESS: So if you're saying that you have to
10 modify, modify to do what. That question you have to ask. Now
11 depending upon how you encountered the DNA profile, the
12 question can change.
13 Q (By MS. SCHUBERT) Okay.
14 A Now all of these scientific papers in peer review
15 journals or in symposium proceedings that discusses statistics
16 for cold hit cases, none of these papers explicitly mention
17 what question they're answering. They say my answer is
18 different from others and, hence, there is a controversy. But
19 there's no controversy if you look through the reasoning and
20 read between the lines to find out what question they're
21 answering. The only publicly available document that spells it
22 out clearly is it the DNA Advisory Board recommendation. We
23 said that whatever is written in the literature, there's
24 nothing wrong in any one of them. But they are confusing the
25 issue for the layman because they do not crystal clearly
26 mention what question are being answered.
27 Q Okay. Now -- and you would agree that the literature
28 that Mr. Lynch talked about this morning, the various different

1 articles -- I'll just go through those briefly, but let me
2 start off with an article written by David Balding in the
3 Journal of Gerometrics (phonetic), correct?
4 A Correct.
5 Q Called Errors and Misunderstandings in the Second NRC
6 Report. You've read that?
7 A Yes.
8 Q Okay. And first of all the Gerometrics Journal, how
9 would you characterize that journal?
10 A Well, it's not a journal that I read on a daily basis.
11 It's not a mainstream population genetic or DNA forensic
12 journal. It is -- but there are sort of certain issues of that
13 journal that deal with statistical issues of DNA forensics, so
14 in that context I read several paper published in Gerometrics
15 that deal with DNA forensics.
16 Q Okay. And this particular article, this is Defendant's
17 Exhibit X, that was written in 1997, correct?
18 A Correct.
19 Q And the DAB guidelines were written in 2000, correct?
20 A Yes.
21 Q Now is there anything about David Balding's article there
22 that you would consider to create some type of controversy in
23 the scientific community with about the appropriate statistical
24 calculations?
25 A I would say yes and no. In the sense that as the title
26 of the article indicates, Errors and Misunderstandings of the
27 Second NRC Report, he's obviously objecting to the
28 recommendation 5.1. But he's objecting recommendation 5.1 in

1 order to answer a different question.
2 Q Okay.
3 A Namely, the -- as I said, the recommendation 5.1 of NRC
4 goes to answer the question what is the number -- written as
5 number two here, what is the probability of finding such a DNA
6 profile in the database searched. The answer of that question
7 can be translated into a statement which can be called
8 likelihood ratio.
9 Now David Balding in this article says he decides what is
10 important for a jury to listen to a statement about guilt or
11 presence of that DNA profile in the crime scene. So he
12 translates that likelihood ratio into a posterior probability
13 using the logic of Bayesian, B-A-Y-E-S-I-A-N, inference. Now
14 for that he makes -- he has to make additional assumptions.
15 Namely, prior probability and things like that. Obviously the
16 answer is going to be different from the recommendation of the
17 NRC-2.
18 But nowhere in this article he's saying that I am -- "my
19 dear readers, I'm answering a question different from NRC-2
20 because I think that is what the courts should listen to."
21 Q Okay.
22 A So he has created a question for himself to answer that
23 he thinks relevant for the court to hear. But NRC-2
24 recommendation 5.1 was not answering that question. They were
25 not even addressing that question. So to use these articles as
26 evidence showing that there is a different answer and, hence, a
27 controversy, is a different answer for a different question. I
28 need a nail and a hammer to put a picture up on the wall, but I

1 need a safety pin to put a diaper on my child.
2 Q Okay. Now in terms of your discussions with other

3 members of the scientific community in determining the question
4 of what is the rarity of the DNA profile, have you heard or
5 become aware of any controversy with respect to what the
6 practice is in the forensic science community?
7 A No.
8 Q Mr. Lynch asked you earlier whether or not -- you've
9 written a lot of articles, 500-something articles, he asked you
10 whether you've written any articles on statistical calculations
11 in cold hit cases, right?
12 A (Witness nodded head up and down.)
13 Q And you said no?
14 A (Witness nodded head up and down.)
15 Q Can you tell us why you haven't written any?
16 A Because there is no burning question there. There's no
17 burning need of any novel statistics there. The questions that
18 can be asked, alternative questions for each one of them, there
19 were already a generally accepted and scientifically valid way
20 of answering.
21 Q Okay. So in terms of the various statistical
22 calculations -- product rule, NRC-2 recommendation, likelihood
23 ratio -- would you agree that those statistical principles have
24 already been found to be generally accepted depending on what
25 question you're asking?
26 A Correct.
27 Q Okay. And then -- well, I was going to ask you in terms
28 of no articles on cold hit cases, would you agree that there

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1 was a period of time when there was much discussion or much
2 research on the issue of the appropriateness of the product
3 rule, the scientific appropriateness?
4 A Yes.
5 Q Were there a large --
6 THE COURT: Scientific appropriateness of what?
7 MS. SCHUBERT: The product rule.
8 THE COURT: The product rule.
9 MS. SCHUBERT: Right.
10 Q Would you agree that there was a large amount of research
11 done in that particular area?
12 A Yes.
13 Q And would you agree that there was a large number of
14 scientific articles written on that area?
15 A Yes.
16 Q And would you agree that the reason for all those
17 articles was because there was a lot of discussion on what was
18 scientifically acceptable?
19 A Well, it's sort of -- and I don't want to use that label
20 for the rationale of all these papers.
21 Q Okay.
22 A The logic of validity of product rule has been in
23 literature since 1908. Application of the product rule for --
24 THE COURT: 1900 and what?
25 THE WITNESS: Eight.
26 MS. SCHUBERT: We're slow.
27 THE COURT: You mean a century ago.
28 THE WITNESS: A century ago.

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1 THE COURT: Okay.
2 THE WITNESS: But the application of the product rule for
3 the loci used in DNA forensics is only as recent as the
4 discovery of these loci. 20 years. So there were some
5 investigators who said well, we do not yet know whether the
6 product rule empirically is valid for these loci --

7 Q (By MS. SCHUBERT) Okay.
8 A -- for every population. While it was a subject matter
9 of so trivial interest that National Institute of Health,
10 National Science Foundation did not accept any research
11 proposal to reinvestigate these questions. But under the
12 auspices of National Institute of Justice and with the help of
13 the forensic community we researchers gathered data on the DNA
14 forensic loci in conveniently defined populations as well as
15 anthropologically defined populations to show the validity of
16 the product rule. That's why you see in a large number of
17 publications addressing the validity of the product rule for
18 DNA forensic loci simply because of the recency of the invent
19 of the DNA forensic loci rather than the scientific validity of
20 the product rule as such.
21 Q Okay. All right. How many -- if you could estimate, how
22 many articles were written on the area of the topic of the
23 product rule?
24 MR. LYNCH: Your Honor, I'm going to object to relevance
25 and 352. We're getting into a whole new subject.
26 MS. SCHUBERT: I think it's relevant when there's a
27 hundred-plus articles written on the product rule but there's
28 maybe five articles written alleging there's a raging

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1 controversy.
2 THE COURT: I'll permit it.
3 THE WITNESS: I would say the articles originally
4 exceeded several hundred.
5 Q (By MS. SCHUBERT) Now I just want to go through these
6 briefly, but is there anything about any of the defense
7 articles that you have read -- and I'm not going to go through
8 every single one. I don't know what this is, but any of these
9 articles that in your opinion creates any type of controversy
10 on answering the question of what is the rarity of the DNA
11 profile?
12 A No.
13 Q Okay. Now you had an opportunity to -- Dr. Chakraborty
14 to review declarations submitted by -- in this particular case
15 one by Dr. Lawrence Mueller. Did you have an opportunity --
16 that's Defendant's Exhibit T.
17 A Yes.
18 Q You also had an opportunity to review a declaration by
19 Dr. Dan Krane, Defendant's Exhibit S?
20 A Yes.
21 Q And then I think that's Defendant's Exhibit U, Dr. Sandy
22 Zabell?
23 A Correct. Yes.
24 Q Are you familiar with those three individuals?
25 A Yes.
26 Q And with respect to those declarations, first of all
27 Dr. Mueller, are you aware of him?
28 A Yes.

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1 Q And in terms of Dr. Mueller, are you aware of whether or
2 not Dr. Mueller has in the past advocated positions regarding
3 population genetics that are not scientifically acceptable?
4 MR. LYNCH: Objection. I'm going to object to this
5 witness testifying in detail as to what Dr. Mueller's positions
6 have been, and then whether or not they're scientifically
7 acceptable is a whole other area we're going to have to go into
8 to discuss whether or not they were correct or incorrect. He's
9 testified in several cases gone up to court of appeal and then
10 with Supreme Court with the cases flip-flopping back and forth

11 and they go up. In each of the other areas that the district
12 attorney goes into will open an area which I have to
13 rehabilitate my witness and explain the reasoning why the court
14 of appeal did or did not adopt his position. I think it's just
15 352 material.

16 MS. SCHUBERT: I think if they're going to offer the
17 opinion of their own expert that's testified regularly for the
18 defense where he has advocated positions, Judge, that have been
19 deemed not generally accepted by our own Supreme Court or our
20 own court of appeals, I think it's highly relevant if he
21 continues to advocate positions that are not scientifically
22 accepted.

23 MR. LYNCH: Well, the fact that you articulate a position
24 that is not accepted by three-quarters, seven-eighths,
25 fifteen-sixteenths of the population in the scientific
26 community does not mean you're right or wrong. It just means
27 that the court eventually concluded that the weight of
28 authority was in the opposite direction. It never concludes

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1 that Dr. Mueller was incorrect or in error in any way, and so
2 the probative value is virtually zero. And yet the district
3 attorney seeks to sully my witness by bringing in court
4 opinions that she feels are inconsistent with his opinion.

5 THE COURT: I'm going to overrule the objection.

6 Q (By MS. SCHUBERT) Did you understand that?

7 A So your question was?

8 Q (By MS. SCHUBERT) Are you aware in terms of -- well, you
9 mentioned that you've testified in 80-something cases, correct?

10 A Correct.

11 Q And are you aware of whether Dr. Mueller has also
12 testified in similar case that you have testified in?

13 A In at least more than two dozen cases Dr. Mueller was the
14 defense expert in which I testified.

15 Q Okay. In your opinion has Dr. Mueller offered his
16 opinion regarding statistical calculations that in your view
17 was not a scientifically valid method?

18 A In all of the cases that I testified where I found
19 Dr. Mueller's opinion as well in each of those cases his
20 opinion was not generally -- not generally accepted.

21 Q Okay. And for instance are you familiar --

22 MR. LYNCH: Objection. Nonresponsive. She asked the
23 question whether or not it was scientifically valid, he
24 answered the question whether it was generally accepted.

25 THE WITNESS: So your question was?

26 THE COURT: Well, I'll permit that to stand. I think
27 that is sufficiently responsive.

28 MR. LYNCH: Okay.

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1 Q (By MS. SCHUBERT) In your opinion, Doctor, he's offered
2 testimony in areas that is not generally accepted in the
3 scientific community?

4 A Correct.

5 Q Okay. I'll give you an example you're familiar with --
6 and I don't want to go into details of this calculation, but
7 you're familiar with a statistical calculation called the
8 counting method?

9 A Yes.

10 Q Would you agree that that particular statistical
11 calculation is not generally accepted in the forensic science
12 community?

13 A I do not know whether it is acceptable -- accepted by
14 anybody. NRC-1 rejected it. NRC-2 rejected it. No forensic

15 laboratory has ever used the counting rule.
16 Q And are you aware of whether Dr. Mueller has advocated
17 the counting method in testimony in criminal cases?
18 MR. LYNCH: I would object as to vague as to time. If
19 we're talking about rulings by NRC-1 or NRC-2 or decisions by
20 those bodies as to whether or not it is generally accepted, I
21 think the question as to when Dr. Mueller has made this opinion
22 also needs to be in a certain time frame.
23 THE COURT: I think on cross-examination that can be
24 explored. I'll permit it.
25 Q (By MS. SCHUBERT) Did you get that question?
26 A State your question.
27 MS. SCHUBERT: Can you try that question?
28 (The previous question was then read back.)

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1 THE WITNESS: Yes, I'm aware that he has advocated the
2 counting rule.
3 Q (By MS. SCHUBERT) Okay. Would you agree that
4 calculation offered by Dr. Mueller has in fact been rejected by
5 both the National Research Council number one and number two?
6 A Yes.
7 Q And has, in fact, as far as you know in your opinion has
8 never been utilized by any forensic laboratory in this country?
9 A Correct.
10 Q Are you aware of whether or not Dr. Mueller has attempted
11 in any of your cases that you testified to calculate error
12 rates into a statistical calculation?
13 A Yes.
14 Q And the use of error rates factored into statistical
15 calculations, in your opinion is that generally accepted?
16 A No, it is not generally accepted.
17 Q Okay. Has that been in fact specifically stated in the
18 NRC-2 recommendation?
19 A Yes.
20 Q And in fact, are you aware of whether or not like in
21 California if the use of statistical -- the error rate in a
22 statistical calculation has been rejected in California ?
23 A It has been rejected in several cases.
24 Q And nevertheless, despite that rejection, has Dr. Mueller
25 advocated that position?
26 A Well, I really do not know how to answer that question.
27 Because I cannot put that in the chronology as to whether or
28 not he reasserted that after he heard the opinion of the

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1 previous court. But as recent as six months back I heard him
2 giving testimony, I was present in the courtroom, advocating
3 for use of error rate in statistical calculation.
4 Q Okay.
5 A And some of the court rulings where the error rate,
6 incorporation of error rate in statistics, were rejected.
7 Those rulings were long before he was testifying in the recent
8 cases.
9 Q Okay. With respect to Dr. Mueller, are you aware of
10 whether or not he has advocated that the product rule is not
11 generally accepted?
12 A Yes, a number of times.
13 Q Now do you know how recent it's been since he's advocated
14 that?
15 A At least up until six months back.
16 Q Is that a case similar to what you testified to?
17 A Yes, in Florida.
18 Q Now you also had an opportunity to look at the

19 transcript -- I'm sorry, the declaration filed by Dr. Krane.
20 A Yes.
21 Q Let me just let me back up for one second. With respect
22 to your knowledge of cold hit cases across the country, is
23 there some standard practice once a cold hit has been made to
24 obtain a secondary sample from the suspect?
25 A Yes.
26 Q And as far as you know is that a common practice across
27 the country?
28 A Yes.

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1 Q And does that -- does the obtaining of the secondary
2 sample from the suspect, in your opinion does that necessitate
3 a modification of the product rule in any way?
4 A No.
5 Q In this particular case were you aware in the Deborah
6 Lamar case as to whether the statistics were actually produced
7 prior to the database search?
8 A If I look at the dates of the reports, then it gives me
9 an indication that statistics were generated before. Because
10 statistics were generated from the evidence sample and evidence
11 sample was created before it was subjected to the database
12 search.
13 Q Did you have an opportunity to review the lab reports in
14 this case that a secondary sample was obtained from the
15 suspect, Mr. Robinson?
16 A Correct.
17 Q Would you agree that the statistics in this particular
18 case were generated from the evidence sample and not from the
19 offender sample, whether from the felon database or the
20 reference -- secondary reference sample?
21 A Statistics were done based on the evidence sample
22 profile.
23 Q In reviewing Dr. Krane's declaration, would you agree
24 that he attempts to advocate the position of the NRC-1
25 committee?
26 A Yes.
27 Q Would you agree, Dr. Chakraborty, that that position is
28 not supported by any other forensic laboratory?

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1 A No, it is not.
2 Q Would you agree that that is not a generally accepted
3 practice?
4 A Correct. It is not generally accepted.
5 Q And in terms of Dr. Zabell, would you agree with his
6 declaration in terms of what he advocates?
7 A Interesting, it's hard to interpret the declaration.
8 It's hard to identify what he actually recommends. Because in
9 paragraph three he said that he has read the declaration of
10 Dr. Mueller and believes it accurately describes the
11 controversy. But -- then he goes on to the rationale of the
12 controversy, but in that rationale description it clearly
13 implies that he is answering a question different from the one
14 answered by NRC-2 or NRC-1, or DAB. He goes into likelihood
15 ratio formulation and using likelihood ratio to get a posterior
16 probability based on some priors, and he doesn't give any
17 rationale -- scientific rationale of how those priors are
18 generated. So it's hard for me to identify what he is
19 recommending. But he clearly, like Lawrence Mueller's
20 declaration, or Krane's declaration does not state that the
21 literature or the two NRC reports or the DAB recommendation are

22 answering different questions.
23 Q In terms of the likelihood ratio, that is another
24 statistical calculation that can be used in forensic cases,
25 correct?
26 A Correct.
27 Q In terms of that particular type of calculation, is that
28 calculation used for -- is it generally accepted among forensic

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1 laboratories?
2 A Well, the logic of the calculation is generally used by
3 the forensic community. But likelihood ratio computation or
4 presentation of the likelihood ratio in reports is not done,
5 practiced by the forensic laboratories, because of the
6 intricacies of explaining what that likelihood ratio means.
7 Because it can be very misleading to nonexperts.
8 Q Okay.
9 A Actually, that is clearly stated in DNA Advisory Board.
10 We recommended there is nothing wrong in likelihood ratio. It
11 is a valid statistical concept if it is computed correctly as
12 practiced, but we do not recommend reporting likelihood ratio
13 because very rarely it can be correctly stated and often can
14 mislead the nonexperts because you can transpose the
15 conditioning.
16 Q So --
17 A Just to give an example, if I tell you I have tossed a
18 coin five times and got three heads, I can easily compute and
19 present a likelihood result what is the chance -- what is the
20 likelihood of getting three heads, given that I have tossed it
21 five times. But in using that logic in the context of DNA
22 forensics, often likelihood ratios are stated in a fashion as
23 though that I'm computing the probability that I have tossed
24 the coin five times given that I found three heads.
25 Q Okay.
26 A So it's just the opposite conditioning which can be
27 misleading and often it happens, and it happened in
28 Dr. Zabell's declaration. His statement number -- item number

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1 four, the example that he gave, he's exactly using -- creating
2 a straw man as though someone used the likelihood ratio to
3 reverse the conditioning. And that's a dangerous thing to do.
4 That's why in DAB recommendation we said there's nothing
5 wrong with the likelihood ratio. The principles used in the
6 modified product rule, they can be used to compute a likelihood
7 ratio. But statement of likelihood ratio can be very
8 misleading. So it's not a controversy. It's -- it answers a
9 different question.
10 But the answer to the likelihood ratio question can be
11 very misleading. The observation of DNA match, be it by
12 comparing the evidence profile with a suspect identified
13 through other means or through the database search, are that
14 that type of DNA match, likelihood ratio answer the following
15 question what is the -- how many times it is more likely to
16 occur under scenario one versus scenario two. But stated that
17 it is 300 million more times likely people may understand it as
18 scenario one is 300 times more likely than scenario number two.
19 That is not the answer being provided by the likelihood ratio.
20 And that's the danger of using likelihood ratio. There's
21 nothing wrong in the computation per se. It is what that
22 statistic means can be very misleading.
23 Q Okay. And it's for that reason that the forensic
24 laboratories, the scientific community, does not use likelihood
25 ratio --

26 A Correct.
27 Q -- in DNA forensics?
28 A Correct. The same logic can give answer to a question

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1 very easily understood. Namely the frequency of this profile
2 is no more common than one in 600 trillion or 600 quadrillion
3 or whatever the number is.
4 Q Okay. Now in terms of --
5 THE COURT: I assume we're going to go after 4:30.
6 MS. SCHUBERT: I'm almost done. We have -- we've changed
7 his flight to leave at 12:20 tomorrow. So we have figured that
8 out.
9 THE COURT: I think we ought to use as much time as we
10 can this evening so that we not -- because this does not go
11 swiftly, so that we not jeopardize his leaving and our
12 completion of his testimony. So I'm going to take a brief
13 recess. Let's try to make it a ten-minute break if that's
14 feasible. We'll get back here -- it's about seven after 4:00.
15 We'll get back here in ten minutes and we'll go until roughly
16 5:00.
17 (Proceedings in recess.)
18 THE COURT: Okay. The record will show all parties are
19 present, Dr. Chakraborty is again on the witness stand, and
20 Ms. Schubert, you may continue.
21 (By MS. SCHUBERT) Dr. Chakraborty, to review your
22 testimony of today, would you agree that based upon your
23 experience over last 30 years as well as research and things of
24 that nature that when addressing the question of what is the
25 rarity of a particular DNA profile from a crime scene sample
26 that the generally accepted method of statistical calculations
27 is the use of the product rule?
28 A Yes.

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1 Q Would you agree that that is what is utilized in the
2 forensic community when addressing that particular question?
3 A Yes.
4 Q And then lastly, Dr. Chakraborty, and this may -- the
5 ultimate answer may come on the 21st, but in terms of your
6 testifying as an expert, do you yourself charge for your
7 services?
8 A Yes. You will get a bill from University of Cincinnati
9 Health Science -- Environmental Health Foundation.
10 Q And is that -- how much kind of bill are we talking
11 about?
12 A \$300 an hour for examination and preparation. \$3,000 a
13 day or part of it for my presence in the courtroom.
14 Q Okay. And has that been the standard fee that's been
15 charged since you've been testifying as an expert in forensic
16 cases?
17 A Yes, since 1998.
18 Q And with respect to that fee, do you personally receive
19 any of that money?
20 A Except for the meals and my taxi fares, no.
21 Q Where does the money go to?
22 A As I said, the foundation -- Environmental Health
23 Foundation of University of Cincinnati College of Medicine gets
24 the money, to be spent not on coffee cups or carpets in the
25 president's office, for research and support of students,
26 support of external faculty members to give seminars and things

27 like that.
28 Q Okay.

1 MS. SCHUBERT: I think that's all I have then.

2 THE COURT: Okay. And that's going to end it for today,
3 correct?

4 MR. LYNCH: That's correct.

5 MS. SCHUBERT: I think that's it.

6 THE COURT: And we'll need Dr. Chakraborty back here on
7 the 21st, and I assume we should try to start at 9:00 on that
8 morning.

9 MR. LYNCH: We could start at 8:30.

10 MS. SCHUBERT: Whatever time the court -- we can start at
11 whatever time the court can start at.

12 THE COURT: I don't know that we can get a prisoner up
13 here before 9 o'clock.

14 MS. SCHUBERT: How about if we're here at 8:30 just to be
15 safe and we can see if we can get someone here.

16 THE COURT: Okay. I'll be here at 8:30 and we'll see if
17 the system can deliver the defendant.

18 ---o0o---

19 (Proceedings recessed to Tuesday, December 31, 2002,
20 9 a.m., this department.)

21 ---o0o---

1 .

2 THE COURT: All right. Good morning 1 and all. First
3 matter we at least should discuss Mr. hill's matter and I
4 note Mr. hill is present and as directed by the court to
5 surrender himself. We have called for an escort officer who
6 will arrive. Do we have any prediction.

7 COURT ATTENDANT: A couple of minutes probably.

8 THE COURT: A couple of minutes probably. Their pre
9 [dixz/] are not always accurate as all of us know. So what I
10 would like to do is proceed with the hearing until we have an
11 escort officer and we will interrupt it for about 30 seconds
12 for the remand of Mr. hill are there any any reasons we can't
13 do it in that fashion.

14 MR. NELSON: Mr. [hig/] insurance.

15 THE COURT: Here we have an escort officer let's call
16 Mr. hill forward. Mr. hill please come forward sir.

17 THE COURT: All right. I directed Mr. hill on Friday
18 to be here at 9 o'clock to remain out of custody to take care
19 of certain affairs. And he is present with his counsel Mr.
20 co- miss key. People are represented by Mr. hug. Mr. co-
21 miss key any problem with going forward with the plan the
22 court announced.

23 MR. NELSON: No, your Honor.

24 THE COURT: All right [mr./] hill you will be remanded
25 into the custody of this officer and you will be in custody
26 and brought back here for further proceedings in this case
27 which we set over I believe two weeks from pry day that would
28 be the 7th of February at 9 o'clock.

1 MR. NELSON: Very well see you then judge.

2 THE COURT: He is remanded with no bail.

3 MR. NELSON: Very well.

4 PLAINTIFF1: Thank you.

5 *****NEW MATTER*****.

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1 IN THE SACRAMENTO SUPERIOR COURT DISTRICT
2 COUNTY OF SACRAMENTO, STATE OF CALIFORNIA
3 HON. PETER MERING, JUDGE, DEPARTMENT 30

4 ---oOo---

5 THE PEOPLE OF THE STATE OF CALIFORNIA,)
6 VS.) NUMBER 00F06871
7 PAUL EUGENE ROBINSON,)
8) Defendant.
9 _____)

10 ---oOo---

11 REPORTERS' TRANSCRIPT OF
12 DAILY PROCEEDINGS

13 ---oOo---

14 MONDAY, JANUARY 27, 2003

15 ---oOo---

16 APPEARANCES:

17
18 For the People:

19 JAN SCULLY, District Attorney for the
20 County of Sacramento,
21 State of California
22 By: ANNE-MARIE SCHUBERT,
23 Deputy District Attorney

24 For the Defendant:

25 PAULINO G. DURAN, Public Defender for the
26 County of Sacramento,
27 State of California
28 By: DAVID LYNCH, Assistant Public Defender
 ROBERT NELSON, Assistant Public Defender

 ---oOo---

 Burgundy B. Henrikson, CSR No. 11373
 Cynthia Lacy, CSR No. 8873

1 I N D E X

2 MONDAY, JANUARY 27, 2003:

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1 MONDAY, JANUARY 27, 2003

2 MORNING SESSION

3 ---oOo---

4 The matter of the People of the State of California
5 versus Paul Eugene Robinson, Defendant, Number 00F06871, came
6 on regularly this day before Honorable Peter Mering, Judge of
7 the Sacramento Superior Court District, State of California,
8 sitting in Department 30.

9 The People were represented by Anne-Marie Schubert,
10 Deputy District Attorney.

11 The Defendant, Paul Eugene Robinson, was not personally
12 present but was represented by David Lynch, Assistant Public
13 Defender and Robert Nelson, Assistant Public Defender, as his
14 counsel.

15 The following proceedings were then had:

16 THE COURT: All right. Let's proceed with our Robinson
17 matter.

18 MR. NELSON: Judge, can we put one thing on the record
19 in the Robinson matter?

20 THE COURT: Yes. We will announce who is here and
21 what's going on. This is the case of the People versus Paul
22 Robinson. Mr. Robinson, pursuant to agreement, waiver on his
23 part, is not present, agreeing to not be present or choosing
24 not to be present during the hearing relating to technical
25 questions regarding DNA evidence.

26 Present is Mr. Lynch and Mr. Nelson representing
27 Mr. Robinson, and the People are represented by
28 Ms. Schubert.

1 Mr. Nelson.

2 MR. NELSON: Um, during the course of this hearing
3 there has been some discussion about either potential or
4 actuality of Mr. Robinson having one or more brothers. We
5 know he has a brother named Elliot Robinson.

6 Ms. Schubert indicated to me, I believe Tuesday of last
7 week, that she had planned to test Elliot Robinson for a DNA
8 profile. So that was in the morning. I had indicated to
9 her, I think some time that morning, that we would like to
10 have a defense expert present during that testing. Now,
11 whether we are actually entitled to do that or not and
12 whether that would be litigated further is beside the point
13 for my objection.

14 The afternoon she came in and said the testing had
15 already been done. So I just want to put it on the record,
16 that fact, so that we won't bring up the fact about whether
17 we had a right to be present or not since the fact is that
18 Ms. Schubert has represented that it is completed.

19 THE COURT: It has occurred.

20 MR. NELSON: So there is a disagreement as to whether
21 we would be entitled to be present, I don't think it is
22 necessary at this moment since it's been done, it's moot.

23 MS. SCHUBERT: Well, the only issue is if they try to
24 raise this issue on appeal purposes that they had a right to
25 be present. I indicated to them this is not a consumption of
26 the sample case. If they want to go get Mr. Robinson's
27 brother's samples and prove one of his brothers actually
28 committed the crime they can obviously do that. We are not

1 dwelling on a limited amount of evidence and if they want a
2 split of the evidence, if we have it, I'm sure we do, we can
3 give them a split of it. But at any rate, I do not believe
4 that they have any right to be present during the testing of
5 a sample of this nature.

6 THE COURT: Well, I assume the testing process consists
7 of putting in a needle and taking a blood sample.

8 MS. SCHUBERT: It was a saliva sample.

9 MR. NELSON: It was a swab.

10 THE COURT: Well, that shows how up-to-date I am.
11 It is a swab of the mouth area?

12 MS. SCHUBERT: Yes.

13 THE COURT: That is the only sample that's required?

14 MS. SCHUBERT: Yes. That's -- I think there actually
15 were four swabs collected from Mr. Robinson, Elliot Robinson.

16 I also told him that one other brother we know of we
17 also collected his sample and did the same thing and both of
18 those brothers have been excluded. So that's that.

19 MR. NELSON: And all I want to say is when they
20 indicated they were planning on testing it, a couple of hours
21 later they said it's done. So I don't think we need to get
22 into a big discussion of the following rights, but I just
23 want to preserve the issue that I haven't waived any claim or
24 objection since it's already been done.

25 THE COURT: Well, I think you're entitled to put that
26 on the record as to what has occurred.

27 Let me ask you this: When Ms. Schubert told you that
28 it was going to be done what was your response to her?

1 MR. NELSON: The first time that she indicated this was
2 when Mr. Lynch was on direct and she kind of gestured to me
3 or mouthed to me that we are going to do that. I understood
4 what she was saying. At the following break I indicated
5 that, um, we would like to be present. Um, it took her a
6 minute or so to realize that I was serious and indicated
7 that, yes, I would like to be.

8 We came back after the lunch hour, and I received just
9 a little sticky that said testing completed or testing done
10 and that was Tuesday, I believe. I have neglected to put
11 that on the record, but I just want to put that fact on the
12 record.

13 Where else it leads, I can't say. I just want to make
14 sure that if there is some intermediate or other test or if
15 the testing hadn't been completed then that would be an
16 opportunity for me to raise any claims that we had to be
17 present, but since it has been done I feel it's -- it's moot
18 at this point.

19 MS. SCHUBERT: And just for the record, um, I will
20 check with the laboratory, but I will make a split of that
21 sample available for Mr. Nelson. So should he choose to do
22 testing of his own, or Mr. Lynch, then we will make that
23 available to them.

24 THE COURT: Well, I think both sides have stated their
25 positions and no ruling is called upon from me at this point.
26 So I would propose we continue with our hearing and recall
27 Dr. Chakraborty to continue his testimony.

28 Good morning to you, sir.

1 THE WITNESS: Good morning.

2 THE COURT: Thank you for returning here in Sacramento
3 again.

4 THE WITNESS: Excuse me --

5 THE COURT: I would assume, always as a joke --

6 THE WITNESS: -- can I get my folder?

7 COURT ATTENDANT: Sure.

8 THE COURT: By all means.

9 I have sort of joked in the past when a witness has
10 been off the stand for a little while that the oath is still
11 good, and I suggested to the jurors an oath lasts for at
12 least several weeks. This kind of pushes the length of time,
13 but I assume the oath still applies and does not have to be
14 readministered.

15 Anyone feel differently?

16 MS. SCHUBERT: No.

17 MR. LYNCH: No, your Honor.

18 THE COURT: Okay. Very good.

19 THE WITNESS: Thank you.

20 THE COURT: All right.

21 CONTINUED TESTIMONY OF

22 RANAJIT CHAKRABORTY, witness called on behalf of the People,

23 RESUMED CROSS-EXAMINATION

24 BY DAVID LYNCH, Assistant Public Defender, Counsel on behalf
25 of the Defendant:

26 Q. Dr. Chakraborty, could I ask -- is it your opinion
27 that there are two questions that should be asked and
28 answered in a cold hit case?

1 A. Yes. Two -- I feel two questions are relevant.

2 Q. And the first is, what is the chance an unrelated

3 person selected at random would happen to match, answered by,

4 the random match probability, correct?

5 A. Correct.

6 Q. And the second is, what is the chance an unrelated

7 person selected by searching the database will happen to

8 match?

9 A. Correct.

10 Q. And that's answered by N, the number of people in the

11 database, multiplied by the random match probability?

12 A. Correct.

13 Q. Okay. Um, fair to say only the first question is

14 relevant in a non database search case, the first question?

15 A. The first question is relevant for non database cases.

16 Q. Um, but the second question is not relevant in a non

17 database case?

18 A. Yes. Correct.

19 Q. So it's fair to say that database search cases are

20 different in that they require addressing an additional

21 question?

22 A. Different to the extent that a second question can be

23 asked because of the database size is nom.

24 Q. Does anybody disagree that this second --

25 THE COURT: The database case is nom?

26 THE WITNESS: Nom.

27 THE COURT: A nom number?

28 THE WITNESS: Correct.

1 Q. (By MR. LYNCH) Does anybody disagree that this second
2 question becomes relevant in a database case?

3 A. Does anybody disagree?

4 Q. Do you know of anybody in the scientific community who
5 says this second question is not relevant?

6 A. Yes. In court discussions I have seen testimony of
7 persons who say that second question is not relevant.

8 Q. And who said that, which expert said that?

9 A. I can't recall exactly how many there would be but
10 since this issue is discussed in court and portrayed as a
11 controversy, sure, it has come up.

12 Q. Okay. My question is, You can't tell me any of the
13 people -- you can't tell me just one person who has said that
14 this second question isn't relevant?

15 A. I didn't understand your question.

16 Q. Well, I asked you earlier, Is there anyone who
17 disagrees that this second question becomes relevant in a
18 cold hit case and you said, I have heard testimony by people
19 who said that it isn't relevant in a cold hit case.

20 Is that a fair summary of your testimony?

21 A. Yes.

22 Q. Okay. Who has said that it's not relevant in a cold
23 hit case?

24 A. Well, if I remember the history of this case correctly
25 I think there are briefs in this case where persons are
26 named, um, saying that they are -- that in cold hit cases the
27 random match probability, the second question answered,
28 namely the probability of finding the profile database, can

1 be problematic. I have seen declarations from Dr. Laurence
2 Mueller, Dan Krane among others to that effect.

3 Q. Okay. But besides the pleadings or the declarations in
4 this case, have you heard of anybody in the scientific
5 community who says the question about finding a person in a
6 database of a given size is not relevant in a cold hit case?

7 A. In scientific literature I have not seen.

8 Q. Okay. What about in your conversations with
9 scientists, are there any scientists who have told you, I
10 don't think that second question is even relevant in a cold
11 hit case?

12 A. I don't think anybody has said that -- made that
13 statement. They have argued in scientific conferences as
14 well as in some papers that the statistical strength can be
15 judged in a cold hit case by statistics other than N times P.

16 Q. Okay. So you are saying they come up with a different
17 solution, but everybody agrees that that second question is a
18 relevant question?

19 A. In scientific literature, yes.

20 Q. Now, the random match probability answers a very
21 specific question; fair to say?

22 A. Yes.

23 Q. It answers the question, what is the chance that one
24 randomly selected person would happen to match -- unrelated
25 person would happen to match?

26 A. What is the expectant frequency of that profile out in
27 the population would be a better statement for a random match
28 probability.

1 Q. So you disagree that the random match probability is
2 answering the question, what is the chance that a random
3 unrelated person would happen to match the evidence profile?

4 A. I don't disagree.

5 Q. Okay.

6 A. I'm saying that the way the random match probability is
7 computed, the best description of that would be what is the
8 frequency of that kind of a profile in a population.

9 Q. Okay.

10 A. Which is statistically equivalent to asking, what is
11 the chance a randomly selected unrelated person would have in
12 that profile.

13 Q. Okay. But it's fair to say that the random match
14 probability does not tell us how many people in a given
15 population will have the profile, does it?

16 A. No, it does not.

17 Q. So in that sense it doesn't tell us the rarity of the
18 profile, correct?

19 A. It tells the rarity of the profile, its expected
20 frequency of the profile in a population.

21 Q. Okay. Now, who is it, besides yourself, who says that
22 the random match probability is not answering the question,
23 what is the chance a random person unrelated will happen to
24 match?

25 A. I didn't understand the question.

26 Q. Okay. Well, I'm getting some resistance from you when
27 I'm asking that the random match probability addresses a
28 question, a chance a random person unrelated happens to

1 match. You're trying to -- when you answer it you are trying
2 to tell me, oh, well, it is better described as dealing with
3 rarity.

4 What can you point me to in the literature that
5 suggests that the random match probability is better
6 described as a rarity statistic rather than a random match of
7 an unrelated person?

8 A. Let me give you an analogy. We know that the English
9 language has 26 alphabets, and the first alphabet is A,
10 right? So who says that it is A, not B? Is there an answer
11 to that question? Clearly not.

12 The random match probability -- the way it is
13 computed, it is computed as the expected frequency of the
14 profile which mathematically or statistically is the same
15 thing as saying that this is the probability that a randomly
16 selected unrelated person would match that profile. It is
17 the logic of the computation that makes this equivalent.

18 Now, who said that? Answer is, I can't, um, say who
19 agrees with that because it is as fundamental as the first
20 alphabet of the English language is A.

21 Q. Well, it's called a random match probability, correct?

22 A. Correct.

23 Q. And it would be fair to say in the literature that it's
24 almost exclusively described as answering the question, what
25 is the chance a random person unrelated will happen to match?

26 A. Correct.

27 Q. And you can't point us to any article or person who has
28 stated that it actually addresses rarity or frequency?

1 A. It is because the way the computation is done, that is
2 the frequency of the profile. We take the elements of that
3 profile and we use their respective frequency and then use
4 some principles of population genetics to compute the
5 frequency of the profile, and it is the fundamental law of
6 probability that makes the equivalent. I cannot point out
7 any statement in the literature saying that these two are
8 equivalent, but the way the computation is done -- any post
9 year graduate student who has a course in probability would
10 see the equivalence.

11 Q. Okay. When you are saying that it addresses the
12 frequency or rarity of the profile, you have to add on the
13 assumption it addresses the frequency or the rarity of a
14 profile in a population of completely unrelated individuals,
15 correct?

16 A. Yes. In -- in theory strictly so, yes.

17 Q. So the fact that we don't have in any situation in the
18 real world a population of completely unrelated individuals
19 that's a drawback to just shorthand of calling this rarity or
20 frequency, correct?

21 A. I don't think so because if you ask the question, my
22 relevant population is the population of related individuals,
23 we can carry out the same logic and come up with an answer of
24 that question.

25 Q. There is also the stated concern that although you may
26 have a random match probability that is exceedingly rare,
27 once you know that a copy of that profile exists, because you
28 have seen it in the evidence, it becomes more likely that

1 other copies will exist in the population; fair to say?

2 A. Yes, fair to say.

3 Q. And that explains the fact you may have a random match
4 probability of 1 in 650 quadrillion yet, you know, you have
5 one, possibly more, in a population in the United States
6 which is far less than 650 quadrillion?

7 A. I wouldn't say far less than but it will be less than
8 if you condition the event on the fact that it has been seen
9 in a different individual.

10 THE COURT: I'm not sure I understand what you just
11 said. If you condition the event on the fact it has been
12 seen -- this profile has been seen in a different individual?

13 THE WITNESS: Correct.

14 THE COURT: Now, does that mean that we assume it's a
15 different individual then we have a match?

16 THE WITNESS: Correct. We have to assume that.

17 THE COURT: We have to assume that?

18 THE WITNESS: Correct.

19 THE COURT: But, in fact, it may not be that case?

20 THE WITNESS: Yes.

21 THE COURT: Okay.

22 Q. (By MR. LYNCH) Now, the second question, what is the
23 chance of finding that person in a offender database of a
24 given size, that question is still appropriate even if the
25 evidence is retested, correct?

26 THE COURT: Even if the evidence is what?

27 Q. (BY MR. LYNCH) If the evidence is retested, correct?

28 A. Yes.

1 Q. And it's still an appropriate question even if the
2 reference sample is retested, correct?

3 A. Yes, that specific reference sample.

4 Q. Now, without getting into what the particular
5 recommendations are at this point in time, um, you would
6 agree that the following groups have expressed opinions on
7 the statistics to be used in database search cases; firstly,
8 NRC I, second, NRC II and third, Balding, Donnelly, Weir,
9 Evett and Foreman as a third group.

10 Would you agree that those three groups have indicated
11 their opinion as to what are the appropriate statistics in
12 cold hit cases?

13 A. I won't qualify them as appropriate. They have made
14 recommendations with regard to different question -- separate
15 questions with regard to cold hit cases.

16 Q. Okay. With regards to the statistics to be used in
17 cold hit cases, um, who have you specifically talked to about
18 this issue?

19 A. Who have I talked to?

20 Q. Yes. Specifically seeking other expert's opinions on
21 the statistics to be used in cold hit cases?

22 A. Well, I don't think I would be able to give you a
23 comprehensive exhaustive answer because I have attended at
24 least six or seven meetings during the deliberations of the
25 National Research Council second committee. So, um, some of
26 those meetings were what they call town meetings where there
27 were persons of different expertise expressing their views.

28 Then, um, since that time I have attended probably more

1 than eighteen or twenty international meetings at several of
2 which this issue was discussed. So I won't be able to give
3 you a comprehensive answer.

4 Q. Okay. Well, let me interrupt here and ask you at the
5 six or seven town meetings for NRC II, who was it who put
6 forth an opinion on cold hit cases?

7 A. Well, I have the same answer, it would be very
8 difficult to give comprehensively but Dr. Elizabeth Thompson
9 for example.

10 Q. Thompson?

11 A. Yes. From Seattle. Laurence Mueller. Then attorneys
12 like William Thompson, um, and members of the NRC II like
13 James Crowe, Mashatoshi Nei, Tom Nagylaki, George Sensabaugh.

14 Q. Okay. Now, you are saying these people in their
15 presentations at the NRC II meetings or in the discussion
16 groups actually said, Here's my opinion as to how a cold hit
17 case should be treated statistically?

18 A. Yes.

19 Q. What did Ms. Thompson -- I think you said Elizabeth
20 Thompson, what was her opinion?

21 A. If I remember -- frankly speaking, I don't remember.
22 She opened -- I believe her statement is, I have nothing new
23 to add on this point.

24 Q. Okay.

25 A. And then she clarified that it could be based on
26 likelihood ratio or if you can use a reasonable prior it can
27 be translated into a Bayesian statistic.

28 Then when asked, what is -- what does she mean by

1 reasonable prior. She said, I don't have any suggestion.

2 Q. Okay. When she said she has no comment in addition,
3 was she referring to the literature published to date or was
4 she referring to a particular question?

5 A. More or less so because if I remember correctly before
6 that NRC II committee members had already stated that this is
7 our draft opinion, which essentially is there are two
8 questions and here are the answers of the two questions.

9 Q. What was Laurence Mueller's opinion at the NRC II
10 meeting?

11 A. I think at that time he basically said that the NRC I
12 recommendation has to be adopted.

13 Q. So he was sticking with NRC I at that point?

14 A. Correct.

15 Q. What did Mr. Thompson --

16 MS. SCHUBERT: I'm going to object to relevance, Judge.
17 He is an attorney, not a scientist. I don't consider -- I
18 don't believe he is a member of the relevant population or
19 relevant scientific community.

20 MR. LYNCH: Just for the fact that he is addressing the
21 NRC II and influencing their opinion and this witness has
22 cited him as an individual that he has relied upon.

23 MS. SCHUBERT: He didn't say he relied on his opinion.

24 THE COURT: He did not say he relied upon him. He said
25 he has heard his comments.

26 MR. LYNCH: Well --

27 THE COURT: Well, let's ask the -- let's ask the witness
28 is William Thompson a qualified person to render an opinion

1 in this area in his judgment.

2 Do you have an observation as to William Thompson's
3 qualifications?

4 THE WITNESS: In my opinion, no.

5 Q. (By MR. LYNCH) So the two individuals that you have
6 recollected from the town meetings are Elizabeth Thompson and
7 Laurence Mueller, correct?

8 A. As I said, there were others like the members of the
9 second committee.

10 Q. Well, let's get into those.

11 What did the members of the second NRC committee say
12 regarding cold hits at those town meetings?

13 A. It is best summarized in their report.

14 Q. Okay.

15 A. I --

16 Q. Did they say anything besides their report or did they
17 stand up and say, This is our report, this is what we intend
18 to publish, anyone have any comments?

19 A. Well, you are talking about events that happened eight
20 years back and without the transcripts of those town meetings
21 it would be very difficult for me to literally say what they
22 said at that meeting, but what they said at the meeting is
23 completely consistent with the summary recommendations of the
24 report.

25 At least three of them in recent communications through
26 email when I told them that, this is how I researched it,
27 your recommendation, am I correct, and they, at least three
28 of them, agreed with me.

1 Q. My question is, Back at the NRC II town meetings -- I
2 know you can't remember exactly what was said -- did they
3 give a great presentation on cold hit statistics or did they
4 just essentially refer to their report and seek comment?

5 A. Yes. They -- it is the latter.

6 Q. Okay.

7 A. They said that we have discussed this issue, this is
8 our draft, our recommendation, is there any other opinion,
9 express it. When other different opinions were presented
10 those persons were interrogated, if you want to say, or asked
11 how -- why do you believe that. The answers that they gave
12 were not convincing to the committee to revise the
13 recommendations.

14 Q. Now, you said that you have been to eighteen to twenty
15 international meetings and some of those have involved
16 presentations of cold hit statistics?

17 A. Correct.

18 Q. Do you recall exactly which ones have involved
19 presentations of cold hit statistics?

20 A. Well, I believe there was a meeting, um, prior to the
21 publication of the Donnelly/Balding paper where David
22 Balding, in his presentation, talked about the NRC II
23 recommendation and pointed at situations where the NRC
24 recommendation can be, um, conservative.

25 Q. What meeting was that at?

26 A. It's a meeting organized annually by Cambridge Health
27 Institute called International Conference of DNA Forensics.

28 Q. Can you remember any other presentations in any other

1 meetings?

2 A. This issue was also discussed, um, in at least a few
3 annual meetings of ProMega Corporation. Their international
4 conference of human identification in one of which Bruce Weir
5 presented what is written in his book with Ian Evett.

6 Q. Do you remember what year that was?

7 A. I don't remember the year.

8 Q. Um, he was presenting the book?

9 A. Yeah. His presentation was basically the materials
10 that was published in his book with Ian Evett.

11 Q. Um, can you remember anyone else talking at the ProMega
12 meetings on cold hit cases?

13 A. I don't recollect.

14 Q. Okay. I believe you said on direct examination several
15 weeks ago something about Mr. Carmody and Mr. --

16 A. That was not in the context of the ProMega meeting.

17 Q. Okay.

18 A. George Carmody is a core member with me on the New York
19 DNA subcommission, and at the subcommission meeting we have
20 discussed this issue several times.

21 Q. Okay. So that was an informal discussion, it wasn't a
22 presentation by Mr. Carmody?

23 A. No.

24 Q. Okay.

25 A. Well, he is not Carmody, Carmody, C-a-r-m-o-d-y.

26 Q. Oh. And Mr. Coffman, do you remember a presentation by
27 Mr. Coffman?

28 A. David Coffman.

1 Q. Was that a presentation?

2 A. It was not a presentation. He was -- for a part of the
3 life of DNA Advisory Board either he was DNA Advisory Board
4 member or a invited, um, person expressing his opinion.

5 Q. But expressing his opinion in a informal discussion,
6 not as a presentation?

7 A. Well, these are not formal scientific presentations.
8 When such national or international committees are created we
9 always invite persons who can give us -- give us a different
10 viewpoint or opinion or practice on the subject. David
11 Coffman is in charge of the offender database for law
12 enforcement agency, was invited at this meeting. He might
13 have been a member of DNA Advisory Board for awhile as well.

14 Q. So during the discussions at the DNA Advisory Board how
15 much time would you say was taken up discussing the
16 statistics in cold hit cases?

17 A. At least one meeting.

18 Q. How long?

19 A. Per day.

20 Q. How long?

21 A. At least one full-day meeting.

22 Q. Okay. And what year was that?

23 A. Well, I cannot exactly say on which date or year the
24 cold hit case was discussed, but it would have been towards
25 the end of our charter. So it should be -- it should have
26 been either late 1999 or early 2000.

27 Q. Okay. Now, you agree that the NRC I recommended
28 position is to test independent loci, correct?

1 A. Yes. At that time in 1992 considering what was going
2 on, what was being tested for offenders database, yes, that
3 was the recommendation.

4 Q. And while you agree with the recommendation, um, would
5 you agree that that method does actually remove the selection
6 bias from a database search?

7 MS. SCHUBERT: I'm going to object to that as vague.

8 THE COURT: I think we better define and see -- it
9 assumes that he agrees there is such a thing as selection
10 bias.

11 MR. LYNCH: Okay.

12 Q. (By MR. LYNCH) The NRC II recommendation and the NRC I
13 recommendation, fair to say, were concerned that when you
14 search through a large pool of people it becomes more likely
15 that a coincidental match will arise, correct?

16 A. No. Coincidental -- nobody has said in any way that
17 when you search a large database coincidental occurrence will
18 increase.

19 THE COURT: Coincidental what?

20 THE WITNESS: Occurrence.

21 THE COURT: Occurrences. Thank you.

22 Q. (By MR. LYNCH) So you disagree that as compared to a
23 one-on-one test a test of 30,000 people doesn't make it
24 anymore likely than a coincidental match will arise?

25 A. In a single person, no.

26 Q. So compared -- if I have two hypotheticals, in
27 hypothetical one I go out and test one person, okay?

28 A. Okay.

- 1 Q. Hypothetical two I go out and test 30,000 people.
- 2 A. Correct.
- 3 Q. Okay. In hypothetical two are you saying it's not more
- 4 likely that by chance I will find one person who happens to
- 5 match?
- 6 A. You are asking a second question. It is -- it is not
- 7 the answer that I gave you earlier. You asked about
- 8 coincidental occurrence randomly.
- 9 Q. Yes.
- 10 A. The answer is to be obtained by computing the frequency
- 11 of the profile. But your second question, if I look at one
- 12 individual what is the chance that he will match these
- 13 profiles in the evidence sample. Second question is, if I
- 14 look at 30,000 people what is the chance one person will
- 15 match. These are two different questions, answers are
- 16 different.
- 17 Q. Okay.
- 18 A. NP versus P.
- 19 Q. Okay. And it would be fair to say that you could
- 20 reduce the second -- well, let me strike that.
- 21 Regardless of which question you are asking, is it more
- 22 likely that you will happen to find somebody to match by
- 23 chance if you look at one person as if you look at 30,000
- 24 people when is it more likely you will happen to find
- 25 somebody to match by chance?
- 26 A. Somebody to match by chance -- somebody?
- 27 Q. Yes.
- 28 A. Well, in the second case when you look at more people.

1 Q. And when you look at -- as that number of people you
2 look at gets bigger and bigger the chances that you will
3 happen to find somebody who matches will increase, correct?

4 A. Correct.

5 Q. Okay. And would you agree that that is -- could be
6 determined as selection bias, a bias --

7 A. It is not a selection bias.

8 Q. Okay.

9 A. It wouldn't be a selection bias. If you make the same
10 mistake as you tried to make it wouldn't be a selection bias.
11 If you make the same mistake that you tried to make earlier,
12 namely equate discussion with random match probability.

13 Q. The concern that the more people you look through the
14 more likely you are to have a coincidental match, that
15 concern is completely removed by the NRC I method, correct,
16 even though you don't approve of it that does remove that
17 concern?

18 A. First of all, it is not -- I don't consider it as a
19 concern. If you look at 30,000 people the chance that
20 someone in the 30,000 will match this profile will increase,
21 it is not a concern, it is a statistical fact and a reality
22 of life. It is not a concern.

23 Q. You don't think the NRC II was concerned about that and
24 that's why they made their recommendation?

25 A. I don't think that they have at any time said that it
26 is their concern. They said that the random match
27 probability -- you can go beyond the concept of random match
28 probability in a database search issue, and the second

1 question being, these are -- the recommendation is multiplied
2 by the random match probability with the size of the database
3 so that it answers the second question. It is not a concern
4 or a bias.

5 Q. You don't think the fact that they say that this must
6 be addressed suggests that they are concerned with this
7 concept?

8 A. If you ask a second question, answer of which is not
9 given by random match probability, obviously it must be
10 addressed. When it can be addressed -- addressed
11 particularly conservatively, which is required in legal
12 settings, the answer is perfectly correct, and I don't
13 consider that as a concern.

14 Q. You don't recall in the literature people saying that
15 the -- the weight or the significance of the evidence can be
16 vastly or significantly overstated unless this issue is
17 addressed, the issue meaning the increased likelihood of a
18 coincidental match?

19 A. Yes. The -- there are statements in the literature
20 like that, but I don't think I would fully agree with that
21 that's how, as geneticists, we can give the weight of a DNA
22 evidence.

23 Q. Well, you would agree though that some people have
24 expressed a concern about the increased probability of a
25 random match through a large database search?

26 A. Yes. There are some people who express concern, but
27 you have to remember the -- that when they express their
28 concern they make additional assumptions which are as crude

1 or as dangerous as you, me or the judge has the same chance
2 of depositing the DNA at that crime scene. Such strong
3 assumptions are also made, and we have to realize the reality
4 or reasonability of those assumptions.

5 When they say that in the same paper after making that
6 implicit assumption, they say that is the reason why, um,
7 these concerns are faced in order to give the proper weight
8 of the DNA evidence.

9 Q. Now, dealing with the NRC I recommendation, who do you
10 know who supports this position?

11 A. Which position are you talking about?

12 Q. The NRC I position on cold hit cases.

13 A. I have no idea -- no -- no current knowledge except
14 George Sensabaugh.

15 Q. Okay.

16 MS. SCHUBERT: Um --

17 Q. (By MR. LYNCH) Do you have --

18 THE COURT: Well, wait just a second. The question was
19 who presently supports NRC I?

20 THE WITNESS: Correct.

21 THE COURT: And that is the aspect of NRC I that you
22 you don't consider the loci that lead to the hit, you have to
23 get additional loci after the hit?

24 THE WITNESS: Correct.

25 THE COURT: And you believe Sensabaugh supports that?

26 THE WITNESS: No. I said that -- he asked me the
27 question, who do I know of on NRC I and I said, I have not
28 contacted any of the NRC I members except knowing what

1 Sensabaugh now believes. He -- Sensabaugh -- today -- to
2 clarify, George Sensabaugh today does not agree with the NRC
3 I recommendation.

4 MR. LYNCH: Okay.

5 Q. (By MR. LYNCH) You haven't contacted any of the NRC I
6 members yourself?

7 A. No.

8 Q. Um, have you contacted -- have you attempted to make a
9 presentation at the ProMega meeting on this issue of cold
10 hits?

11 A. I have not made any formal presentation on the cold hit
12 cases, but I have discussed this subject. I made comments
13 after, um, the -- the other presentators' views were
14 discussed.

15 Q. Now, you said that you are a faculty member of TWGDAM,
16 not a formal member; is that correct?

17 A. Yes.

18 Q. Have you contacted all of the members -- the formal
19 members of TWGDAM to try to get their input on the statistics
20 for cold hit cases?

21 A. Well, the -- I won't say -- it was a informal request
22 of several TWGDAM, not SWGDAM, meetings. The subject of cold
23 hit cases was a subject, and as faculty member I presented my
24 position; namely, the answer of the two questions, random
25 match probability and the chance of finding that profiling
26 database of certain size, this should be present. We
27 discussed that since this is the standard SOP, standard
28 operating procedure, of most of the TWGDAM laboratories

1 exclusively, I assume that the TWGDAM group is in concert
2 with that recommendation.

3 Q. So they didn't -- no one at the meetings explicitly
4 said, We agree with you that there are two questions to be
5 asked in a cold hit case?

6 A. Well, there is no written document of that.

7 Q. Well --

8 A. But since this is the -- the recommendation or practice
9 protocol that I have seen in standard operating procedures of
10 many TWGDAM laboratories I -- my position is this is the one
11 which is generally practiced today.

12 Q. Okay. But there is a TWGDAM group -- you keep talking
13 about TWGDAM laboratories. There is a TWGDAM group, right,
14 which is a board or group of people?

15 A. Yes.

16 Q. And you made a presentation to that group saying, I
17 assume, My position is there are two questions and two
18 answers in cold hit cases?

19 A. Correct.

20 Q. And did any of those board members at that presentation
21 come up to you either in written or oral format and say, I
22 agree or I disagree?

23 A. No, not in written.

24 Q. How about orally? Did anybody come up to you and say,
25 I agree with you?

26 A. Yes. Several said orally.

27 Q. Okay. And several out of how many?

28 A. I couldn't remember the number.

1 Q. Are we talking ten or one hundred? I have no idea.

2 A. Well, let me explain what the reality is. It is not a
3 meeting of ten or twelve persons, there are twenty-seven or
4 twenty-nine SWGDAM laboratories. When we have our quarterly
5 meetings we have literally more than one hundred fifty
6 persons. So how many said what is impossible to tell, but
7 the way that we, um, say that this is what is generally
8 practiced is we see the standard operating procedures and if
9 they are at variance with others, those are pointed to us
10 saying that that laboratory does not agree or agrees with
11 this recommendation. As of today I have not seen any
12 standard operating procedure which is at variance with these
13 recommendations.

14 Q. Are you saying then that all of the standard operating
15 protocols that you have seen state that the laboratories
16 should address two questions and two answers in cold hit
17 cases?

18 A. It may not in that language. Not all laboratories have
19 the same SOP in detail, not in the same language, but I have
20 not seen anything that is in disagreement with that.

21 For example, I believe the -- if you look at my
22 transcript of the direct examination I said that I agree with
23 NRC II. The way that I explain what NRC II recommendation is
24 is not word by word, same as recommendation written in the
25 report. But when I specifically ask at least three persons
26 of NRC II saying that this is what I stated in a case where
27 cold hit statistics was discussed in court and I interpreted
28 this statement as equivalent to your recommendation? Yes.

1 Do you agree with this statement? All three of them said,
2 Yes, you interpreted it as correctly.

3 Q. Okay. I'm talking about the standard operating
4 protocols of the laboratories?

5 A. I was giving you the answer of that question.

6 Q. Okay.

7 A. The answer being the same. You stated that SOPs said
8 in a cold hit case there are two questions and two answers.
9 I don't think you will find many SOPs that would describe
10 that in that language.

11 Q. I understand.

12 A. But the way they say that cold hit -- for cold hit
13 cases we will implement these statistical, um, calculations
14 and what they do is exactly the answer of these two
15 questions.

16 Q. Okay. And just to confirm -- I'm not going to ask you
17 for the exact wording of the standard operating protocols,
18 but are you telling us that in all of the standard operating
19 protocols you have seen that they suggest in a cold hit case
20 the calculation N multiplied by the random match probability
21 should be done?

22 A. Well, some laboratories say these two questions are the
23 relevant questions. In our laboratory we will use these and
24 express this. In some laboratory they say, we will do both
25 and some laboratory will say, we will only answer the second
26 question.

27 Q. So you are saying some say they will only answer the
28 second question and some say they will answer both; is that

1 fair to say?

2 A. Yes. That is probably the reality.

3 Q. Okay.

4 A. Since I have not read all of the 27 or 29 SOPs I can
5 not say how many of which kind, but this -- all of them, they
6 said because of NRC II or DAB recommendation, we will adopt
7 this procedure.

8 THE COURT: I'm not sure I understand. We use --
9 Mr. Lynch used phrases, first question and a second question,
10 and you were asked, and I got the impression, that all
11 laboratories will answer question number one and some will
12 answer also question number two.

13 Now, is that roughly what you said?

14 THE WITNESS: Yes. The --

15 THE COURT: And which is question number one and which
16 is question number two? That's what I find unclear.

17 THE WITNESS: Random match probability is question
18 number one.

19 THE COURT: All right.

20 THE WITNESS: And second is the chance of finding that
21 profile in a database of certain size.

22 THE COURT: All right. So are you --

23 THE WITNESS: But all of the SOPs recognize that there
24 are differences in these two questions.

25 THE COURT: That they are different questions?

26 THE WITNESS: These are different questions.

27 THE COURT: All right.

28 THE WITNESS: And, in fact, I believe all of -- all of

1 the laboratories state that the database size also will be
2 reported by us.

3 MR. LYNCH: Okay.

4 THE COURT: Are you saying that all of them do
5 calculate the random match probability?

6 THE WITNESS: Correct. In fact, the -- that has to be
7 computed because in answering the second question it is the
8 same random match probability that is multiplied by the
9 database size.

10 THE COURT: Do they all report the random match
11 probability in their finding -- in their conclusion? Do they
12 all report the random match probability?

13 THE WITNESS: Yes, they do.

14 THE COURT: All right.

15 MR. LYNCH: I think the Judge has kind of hit on
16 something here.

17 Q. (BY MR. LYNCH) Earlier in the proceedings we were
18 using two terms, and I will write them up here, RMP for the
19 random match probability and we were referring in shorthand
20 at some point in time to the data match probability where
21 that was equivalent to N times the random match probability
22 or what we have been talking is the second question.

23 So do you understand that distinction there?

24 A. Yes. In fact, I would -- the reason that NRC II did
25 not come up with a name for N times P is because as soon as
26 you make these two nomenclatures it somehow tries to give you
27 a feeling as though something is basically changed as soon as
28 you consider it a database.

1 Q. Now, you are saying the reason NRC II didn't do that --
2 do you know that or are you inferring that?

3 A. I'm referring to this.

4 Q. No. Inferring?

5 A. I'm inferring it.

6 Q. Okay.

7 A. Because what this answers is not quite a match
8 probability, it is the chance of finding this profile at
9 least once in a database of certain size.

10 Q. Okay. Let's -- let's forgive --

11 THE COURT: Now, have you finished your explanation on
12 this distinction?

13 THE WITNESS: Yes.

14 THE COURT: Okay.

15 MR. LYNCH: I'm sorry, Judge.

16 Q. (BY MR. LYNCH) Let's forgive our inaccuracies. I'm
17 trying to get some shorthand so we don't get confused. I
18 admit I was referring to question one and question two and
19 there is some ambiguity there.

20 My understanding is when we were talking about question
21 one it was referring to the random match probability,
22 correct?

23 A. Correct.

24 Q. And when we were talking about question two, it was
25 essentially referring to the shorthand of the data match
26 probability?

27 A. Correct.

28 Q. Even though that has got some problems.

1 Back to the standard operating protocols then. Um, I
2 guess my question is, Are you saying that all of the 27 to 29
3 standard operating protocols essentially state that the
4 database match probability should be computed in a cold hit
5 case?

6 A. I did not say that.

7 Q. Okay. So all of them state that a random match
8 probability should be computed but only some of them go
9 further and say also the database match probability should be
10 computed?

11 A. In fact, we can look at SOPs, do they not, they
12 should. We know laboratories do that calculation this way.

13 Q. Okay.

14 A. So all of the laboratories compute RMP, some
15 laboratories compute RMP -- DMP, if you want to call that.

16 Q. Okay.

17 A. But all of them recognize that these are two different
18 questions, and the ones that compute RMP, they also state
19 that this particular case was first identified by searching a
20 database of this size.

21 Q. Okay. When you say all of the laboratories calculate
22 the random match probability, um, there may be some confusion
23 there too because obviously you need to calculate the random
24 match probability to get what we have called the database
25 match probability?

26 A. Correct.

27 Q. Are there any standard operating protocols that suggest
28 that the final calculation should be the database match

1 probability? Do any of them say, um, we are calculating the
2 random match probability so that we can plug it into the
3 database match probability formula? Do they explicitly say
4 that?

5 A. Again, you are getting into some arguments. I do not
6 know simply how to put that into -- what is implicit in
7 computing DMP is you are saying that random match
8 probability, namely the rarity of the profile, remains the
9 same no matter what database you are using.

10 Q. Maybe -- maybe this is -- this is the confusion.

11 Do the -- do the standard operating protocols state
12 what should be presented in a report?

13 A. They say what we present.

14 Q. Okay. When they say what should be presented -- excuse
15 me.

16 When they say what we present in a report, do any of
17 them say, we present the database match probability only?

18 A. Yes. Some say, we present the database match
19 probability only because it -- and it is answering this
20 question.

21 Q. Okay. And some say, we present the random match
22 probability only?

23 A. We present the random match probability. We also say
24 that the database size is this.

25 Q. And some say, we present both the random match
26 probability and the database match probability?

27 A. Yes.

28 Q. I know you can't put numbers on it.

1 Would it be fair to say there is a fairly even split
2 amongst those three or is one the clear majority among them?

3 A. I really don't know how the 29 or 27 laboratories would
4 split.

5 Q. And we are talking about, for some reason, a select
6 group of 27 to 29 TWGDAM or SWGDAM labs; is that right? When
7 you are talking about those 27 to 29 standard operating --

8 A. I'm talking about a select group.

9 Q. I guess that is what I'm asking.

10 Why are you familiar with the 27 to 29 standard
11 operating protocols?

12 A. Because they are the ones who regularly meet.

13 Q. At TWGDAM?

14 A. And there are other laboratories which do DNA typing or
15 DNA testing.

16 Q. Okay.

17 A. And they generally go by what the SWGDAM or TWGDAM
18 practice is.

19 Q. Would it be fair to say that the SWGDAM or TWGDAM
20 practices are modeled for the other laboratories who aren't
21 included in the SWGDAM or TWGDAM group?

22 A. Yes. In fact, there's a clear statement that
23 laboratories, which seek accreditation, they must have to
24 follow the guidelines of the DNA Advisory Board or a
25 subsequent organization, which is namely SWGDAM today.

26 Q. How does a SWGDAM or TWGDAM lab get selected to have
27 the honor of being a TWGDAM or SWGDAM lab?

28 A. Any laboratory which practices DNA typing, um, can

1 participate in SWGDAM or TWGDAM discussions. There is no
2 barr, but since the facilities are limited not all
3 laboratories can be accommodated.

4 It is -- suppose you start a laboratory tomorrow, you
5 are not barred from attending the SWGDAM meetings but because
6 of space limitations you may not be allowed but should you
7 have any issue which is at variance with SWGDAM practices
8 then you can submit them and they will, I'm sure, be
9 discussed.

10 Q. My question is focused on what is so special about the
11 27 or 29 which makes them the core group, the elite?

12 A. There is nothing special because these are -- these
13 represent, I would say, more than 70 or 75 percent of the
14 world -- in the country. So all of them have been doing DNA
15 typing from inception.

16 Q. So it's just a diverse group throughout the country?

17 A. Yes.

18 Q. A representative group you would say?

19 A. It is a geographic representative group.

20 Q. Okay. We kind of got off topic here but we were
21 talking about NRC I and your knowledge of current positions.

22 THE COURT: Let me ask one question -- I was wondering
23 if we were going to get to NRC I.

24 Do any of SWGDAM standard procedures involve the
25 application of NRC I?

26 THE WITNESS: None.

27 THE COURT: Okay. You may continue.

28 Q. (By MR. LYNCH) Regarding the NRC I committee's 1992

1 report, um, has any NRC I committee member published a peer
2 review article on their position of cold hit statistics since
3 that report?

4 A. I don't think I have seen any.

5 Q. Okay. Has the NRC I report been retracted by the NRC I
6 committee?

7 A. Well, it's difficult to say yes or no, but I -- I think
8 in the community we would believe that the NRC I
9 recommendation has been retracted by the -- by the National
10 Research Council.

11 Q. Okay. I'm talking about the report itself. Has the
12 report been retracted, has it been deleted, taken off the
13 shelves?

14 A. How can you take out a published document?

15 Q. Well, I guess -- did the NRC I committee reform or stay
16 formed and say, we retract our initial document?

17 A. No.

18 Q. Now, there were some articles that were critical of NRC
19 I when it came out, correct?

20 A. Yes.

21 Q. Between the time of NRC I and NRC II none of those
22 articles, critical of NRC I, specifically addressed or
23 criticized the cold hit statistic section, correct?

24 A. I don't understand your question because I do not think
25 that I can answer that.

26 Q. Well, between NRC I and NRC II there were some articles
27 published, peer review articles, that were critical of NRC I?

28 A. Correct.

1 Q. When they were critical of NRC I they weren't being
2 critical of the cold hit method, correct, they didn't address
3 that?

4 A. Well, I don't think that there were -- no. I would say
5 that -- let me answer your question.

6 Since there were other issues in NRC I which were much
7 more unscientific the great majority of the criticism of NRC
8 I was -- um, none of them really addressed the cold hit
9 recommendation.

10 Q. Was there any information or articles published,
11 whether it was criticizing NRC I or not, any articles
12 published between NRC I and NRC II discussing the issues and
13 statistics of cold hit cases?

14 A. I don't remember any because the -- during those days I
15 don't think there were very many cold hit cases. So that
16 discussion did not surface that frequently.

17 Q. Okay. The criticisms and discussion of the statistics
18 to be used in cold hit cases came after the 1996 second NRC
19 report, correct?

20 A. I would say that in staying with associating the NRC
21 reports, I would associate it with the frequency with which
22 cold hit cases were being -- were encountered.

23 Q. Okay. I'm not asking for a reason here I'm just
24 asking, would you agree that the criticisms in the published
25 literature only were published after the publication of the
26 NRC second report?

27 A. That's -- I think I have given my answer. The answer
28 is more with respect to how often these cases were

1 encountered. You have to make a clear distinction between
2 the -- what you in legal context portray as controversy.
3 These are not necessarily scientific controversy. These
4 controversies are portrayed from things written or said in
5 court. DNA controversy in scientific world does not exist.

6 Q. Okay.

7 A. There are --

8 Q. My question is solely --

9 THE COURT: Let him finish.

10 MR. LYNCH: Okay.

11 THE WITNESS: So your question was -- when was -- did
12 we find scientific writings or controversies with regard to
13 cold hit statistics? It is not -- since the controversy is
14 mostly generated from another field, namely court
15 proceedings, the controversies are more associated with when
16 cold hit statistics were being presented in the court.

17 NRC II, considering the reality of offender's database,
18 negated the recommendation of NRC I and came up with a
19 suggestion when in courts we were facing cold hit cases then
20 the subject was discussed as to how accurate or conservative
21 the NRC II recommendations are. Yes, we have started seeing
22 printed papers. For example, David Balding and Peter
23 Donnelly or Bruce Weir's book where they said that under such
24 and such scenario, NRC II recommendation can be conservative.
25 Some went farther, that if you assume you and I had the same
26 chance of committing the crime the database search might give
27 you a probative answer.

28 Q. I guess we will move on to the NRC II position.

1 I think you have agreed that the NRC II recommendation,
2 um, is to multiply the random match probability by N, the
3 size of the database, correct?

4 A. That is NRC II's answer.

5 Q. Okay. Who besides the NRC II --

6 THE COURT: Well, do you interpret NRC II to indicate
7 that the multiplication of the random match probability with
8 the size of the database is the proper and is the essential
9 answer that is to be reported?

10 THE WITNESS: Yes. But they also clarified that that
11 answers the question of finding that profile in at least one
12 person in a database of that size. So -- and they made that
13 statement, particularly on page 135, so that it does not get
14 confused with the concept of random match probability.

15 THE COURT: Well, do they -- do you understand NRC II
16 to state that there are two questions and there are different
17 answers to each question?

18 THE WITNESS: Correct. I do understand that.

19 THE COURT: And both of those are questions that need
20 to be answered?

21 THE WITNESS: Answered -- actually, the second question
22 you cannot answer without finding an answer of the first
23 question.

24 THE COURT: Well, that response suggests that the only
25 reason they asked the first question is so they can answer
26 the second question. Now, is that why they answer the first
27 question or does the first question have some independent
28 value and should be provided, um, as well as the answer to

1 the second question?

2 THE WITNESS: I think, um, the clearest way that the
3 NRC II described their recommendation is they said that the
4 second question is more pertinent for database search.

5 THE COURT: All right. Fine.

6 Q. (By MR. LYNCH) And do you agree with that?

7 A. I agree with that, but I also -- I express the view
8 that since the concept of random match probability remains
9 the same, the first question answer does not depend upon
10 whether or not the person is identified by database search.

11 Q. Besides the NRC II committee at the time they published
12 in 1996, would it be fair to say that the DNA Advisory Board,
13 um, endorses the NRC II recommendation?

14 A. Yes.

15 Q. Would it be fair to say also that in his writings
16 Anders Stockmarr has endorsed the NRC II recommendation?

17 A. Yes.

18 Q. Fair to say that the essence of the NRC II
19 recommendation is that the overall evidential weight is
20 lessened because of the database search?

21 A. Lessened with respect to what?

22 Q. With respect -- as opposed to if the case had been
23 investigated with a one-on-one comparison?

24 A. I don't think they have -- I don't think they have said
25 that.

26 Q. You don't agree that Mr. Stockmarr stated that in the
27 latter case, meaning a database search case, a much lower
28 weight should be assigned to the evidence?

1 A. If you -- yes. The answer is yes if you look at the
2 second question which cannot be asked in the first case.

3 Q. Okay. But he -- Anders Stockmarr is talking about the
4 weight of the evidence in general and says, In the second
5 case, a database search, a much lower weight should be
6 assigned to the evidence?

7 A. If you define weight by what he explains the weight is.

8 Q. Okay. But he is saying, is he not, in that document
9 that the significance of the match is less significant
10 because of the database search that the overall weight of the
11 evidence is reduced?

12 A. Yes. You have to -- you have to remember what his
13 definition of weight is.

14 Q. Well --

15 A. His definition of weight is what is the chance of
16 finding that profile in a database of that size.

17 Q. Where does he say that is his definition of weight?
18 When does he use the term weight? Surely he is using it in
19 the common understanding, meaning the significance or the
20 importance of the evidence, correct?

21 A. Again, you and I are trying to interpret his statement
22 in our own way. I do not know what way you may define his
23 weight, but I look at what he computes by weight and my
24 understanding of statistics, using even my first year
25 experience, would be the -- his definition of his weight is
26 namely the answer of the second question.

27 Q. Well, when he says when a suspect of a crime is found
28 as the result of a database search, the weight of the DNA

1 evidence may be severely overstated.

2 A. Overstated with respect to --

3 Q. Overstated. What does he mean when he says the weight
4 may be overstated? Surely --

5 A. So as you realize his statement is quite vague and
6 nonspecific, right, because in that sentence he does not
7 define what weight is, and he does not define what he means
8 by overstated. So we have to go back in his paper elsewhere
9 to find out what he means.

10 When you look at the mathematical formula that he uses
11 as weight, that is that second question, namely, what is the
12 chance of finding that profile in a database of that size.

13 Q. Well, he --

14 A. And overstated, then you would go back, and he was
15 comparing that with the random match probability. So --

16 Q. Well --

17 A. -- you cannot take a sentence out of the context and
18 define each word by your own way to say whether that person
19 is right or wrong.

20 Q. Well, does he say in his article, when I say weight I'm
21 referring to a particular question or a particular answer or
22 a particular formula?

23 A. Show me where he says that weight is the random match
24 probability.

25 THE COURT: Well, I think this might be a good time to
26 take our morning recess. It's 25 after. We will take a
27 15-minute recess and interested parties can peruse the
28 Stockmarr article.

1 MR. LYNCH: Your Honor, I don't believe we have the
2 article exhibit. I have a copy, but it would be prudent to
3 get the exhibits out.

4 THE COURT: You don't have the exhibits?

5 MR. LYNCH: Oh, there is a pile around the corner we
6 didn't see.

7 THE COURT: Very good, sir.

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2 (Proceedings resumed after reporter switch
3 and a morning break.)

4 ---o0o---

5 THE COURT: Okay. The record will show all parties are
6 present.

7 You may continue, Mr. Lynch.

8 Q (By MR. LYNCH) Sir, before the break we were talking
9 about Mr. Stockmarr's paper and how at several points he talks
10 about the weight of the evidence, and you were stating that he
11 didn't ever explicitly state what he meant by weight and you
12 were suggesting that he meant by weight that he meant the
13 weight with regards to a particular question as opposed to the
14 overall evidence.

15 But isn't it fair to say that right at the bottom here --
16 and I'm sorry, I'll zoom in later -- in the latter case,
17 meaning a database search case, a much lower weight in favor of
18 the suspect being the true perpetrator should be assigned to
19 the evidence compared to the former case. Do you see that
20 statement there?

21 A Yes.

22 Q In essence, isn't Mr. Stockmarr right there saying when
23 I'm talking about weight I'm talking about the significance or
24 the importance with respect to the suspect being the true
25 perpetrator, correct?

26 A Correct.

27 Q Okay. So when I gave you all those quotes earlier and
28 you were saying well, weight wasn't defined, it's fair to say

1 weight means the significance with regards to the suspect being
2 the true perpetrator?

3 A Under some assumptions, yes.

4 Q Okay. And so when he says when a suspect of a crime is
5 found as the result of a database search the weight of the DNA
6 evidence may be severely overstated, he's talking about the
7 significance with regards to that being the true perpetrator?

8 A Yes, under the assumption that everybody in the database
9 had the equal chance, prior chance of contributing the DNA at
10 the crime scene.

11 Q Okay. But with that assumption and that caveat, the
12 thrust of Stockmarr's argument and the NRC-2's argument is that
13 the significance of the match should be less when a database
14 search has been undertaken?

15 A Under the assumption that if everybody in the database
16 had the equal prior chance of depositing their DNA in the crime
17 scene.

18 Q Well, does Stockmarr state that in his paper, that
19 assumption?

20 A Just look at his equation two. That without that
21 assumption he cannot make -- compute equation two.

22 Q There's equation two. Where does he state the
23 assumption?

24 A Because he's using the same probability P for everybody
25 in the database.

26 Q My question is, does he state the assumption or not?

27 A First year statistics course you have to take to say that
28 his equation two is valid only under the assumption that

1 everybody in the database had equal prior chance of depositing
2 their DNA in the crime scene.

3 Q Okay. And my question is, besides your referring to
4 first year statistic courses, does he state in his paper that
5 that's his assumption he's dealing with here?

6 A It is as fundamental as A is the first alphabet of the
7 English language.

8 Q So even though he's -- you're saying he's making an
9 assumption that would be potentially significantly different to
10 the true situation because the offender database isn't a random
11 selection of the profile -- of the population?

12 A No.

13 Q Even though he's making that assumption, when it would
14 probably not be true in reality, he doesn't mention that
15 anywhere in this paragraph?

16 THE COURT: Your question is largely unintelligible to
17 me, and I think it misstates what he just said. So let's try
18 it over.

19 MR. LYNCH: Okay.

20 Q Well, let me try and actually get a yes or no answer.
21 Does he aside from inference state in his paper this assumption
22 about an equal chance of being in the database?

23 A No, he does not.

24 Q Okay.

25 A Because he does not feel it is required by someone who
26 wants to under what he means by weight. That's why I have --
27 in my scientific writing I avoid the word weight because there
28 I have to look at some non-genetic or non-statistical evidence

1 in order to make that assumption. I think the weight is
2 something that is to be left to somebody else and we as
3 geneticists or statisticians can only say that did the
4 laboratory find the match. Did they follow the proper
5 protocol.

6 And once we are satisfied, then we give an -- we answer a
7 few questions which can be very objectively and quantitatively
8 answered; namely, the reality of the profile or the chance of
9 finding such a profile in a database search. Then it is
10 somebody else who can use that information to get weight or
11 probability of guilt, whatever they want to compute. We as
12 geneticists or DNA analysts or population geneticists can go
13 only that far of computing the frequency of the profile and
14 computing the frequency of the chance of finding such a profile
15 in a database of certain size.

16 Now if you can -- you can use that information to get
17 your weight or probability of guilt or whatever you want to do.
18 I do not have any genetic or statistical rationale of making
19 those additional assumptions. And without specifically
20 pointing out what assumptions I'm allowed to make, I would
21 refrain from making a statement of that sort.

22 Here Dr. Stockmarr has gone a step farther and said that
23 well, under -- if we're using the classical statistical rules,
24 under that assumption the weight can be computed and the weight
25 is less. Yes, if you allow me to do make those assumptions, I
26 completely agree with him.

27 Q Okay. And that is Stockmarr is essentially explaining or
28 endorsing the NRC-2 method?

1 A Correct.

2 Q Now in 1997, an article by Balding in Gerometrics,
3 pretrial X, also states that the NRC-2 report is reducing the
4 evidential weight or strength of the evidence, correct?

5 A Yes.

6 Q Okay.

7 A If you make those additional assumptions.

8 Q And it says specifically the report takes the view that
9 the effect of such a search is dramatically to reduce the
10 evidential strength against an individual found to match.

11 A Correct.

12 Q Recommendation 5.1 quantifies this reduction, evidence
13 obtained from searching a database of size N is N times weaker
14 than the same evidence obtained by other means?

15 A Correct. If you make the assumption that everybody of
16 those N persons had the same prior chance of depositing their
17 DNA in the crime scene.

18 Q Okay. I'm going to really try and ask you to do a yes or
19 no answer so we can get the focus of this. Does anywhere in
20 Balding's report that we've got up on the screen right now,
21 pretrial X, does he ever mention that assumption? Yes or no.

22 A He does not. But it's implicit in the computation.

23 Q What about the NRC-2 report?

24 THE COURT: Now just a second. You say it's in the
25 computation?

26 THE WITNESS: Yes.

27 MR. LYNCH: Implicit he said.

28 THE COURT: What?

1 MR. LYNCH: He said it's implicit in the computation.

2 THE COURT: Okay. Is there anything in the symbols that
3 are used -- earlier we had Stockmarr's computation or equation
4 or whatever it's called. Is there anything in any of those
5 very confusing to lay persons and very complicated formulas or
6 equations, is there anything in those that somehow shows the
7 assumption that you're referring to? Is there some letter in
8 there that means to all scientists whatever this factor is?

9 THE WITNESS: I would say yes. If you look at his
10 equation two.

11 MR. LYNCH: I'll put it on the overhead, your Honor.
12 Are we referring to this one, Doctor?

13 THE WITNESS: Yes. In his equation two -- it is
14 complicated, but --

15 THE COURT: If you want to point something out to a
16 layman, you can use that device.

17 THE WITNESS: It is complicated. But when he go from
18 this step to this step, he's assuming that everybody in the
19 database had equal chance of depositing their DNA in the crime
20 scene because he does not have any factor. Meaning that that
21 factor is the same in the numerator as well as the denominator.

22 That's the reason of expressing what we are saying on the
23 top as well as the bottom, and expressing that as a ratio that
24 can get into what is in the legal context sometimes called
25 prosecutor's fallacy. But in order to avoid those kind of
26 extraneous information, we can express this one and this one
27 separately and avoid all of the confusion that are raised in
28 court discussions. We can look at this one by looking at the

1 case notes and answer in my opinion do you think that the match
2 is declared properly. Yes. Where if the laboratory did the
3 work right.

4 In the denominator you can express as frequency or chance
5 of finding that profile in a database of certain size. And
6 that way can you avoid all discussions, confusions, and
7 complicated mathematics. The jury can hear that, and if the
8 defense counsel wants they can go back and look at what are the
9 other assumptions that can be stipulated on.

10 THE COURT: Let me ask you, you've been talking about the
11 top section of this formula number two. It starts with P with
12 a small case P, and below in the denominator is P with a small
13 case D. What do those symbols mean to get to very simple
14 ideas? What's P with a small P as compared to P with a
15 small D?

16 THE WITNESS: If you would roll it down a little bit.

17 On the same column he has two hypotheses -- can you go a
18 little bit further up?

19 Yeah. So he has two hypotheses that are HP and HD. So
20 these are in the equation two. The capital P stands for the
21 probability under hypothesis P. And chance of observing the
22 data under this hypothesis, chance of observing the data under
23 the second hypothesis.

24 THE COURT: Which is the D for David.

25 THE WITNESS: D for data, and P for true perpetrator is
26 among the suspects identified in the database.

27 So here his assumption that everybody in the database had
28 the same chance of depositing the DNA in the crime scene. So

1 if you agree with me that is your stipulation, then I totally
2 agree with Stockmarr that the evidence -- the strength of the
3 evidence is reduced.

4 But since I do not have any statistical or population
5 genetic data to make that stipulation, I would say that from my
6 expertise and cumulative research I can say that this DNA work
7 was done scientifically accurately. Second -- after examining
8 the case notes, obviously. Second, my population genetics
9 expertise allows me to answer these two questions and you folks
10 can use these numbers in any way you like.

11 Q (By MR. LYNCH) Well, the only -- well, strike that.

12 Fair to say that the NRC-2 recommendation has some quite
13 complex assumptions, that being one of them you just
14 articulated?

15 A If you define their -- if you use their recommendation to
16 define the strength of evidence, yes, it is an additional
17 assumption. But page 135 clearly says what their
18 recommendation 5.1 means. It means simply that if you got that
19 profile by searching a database of size N, the upper bound that
20 such a profile is not seen in anybody else cannot exceed N
21 times P. I think from a population genetic point of view that
22 is the most correct way of telling what our research shows.

23 Q And that last question and answer that you just testified
24 to has an in-built assumption itself, does it not, that we're
25 dealing with no relatives, correct?

26 A In -- yes.

27 Q Now you have articulated a position that you believe that
28 the appropriate position is to present two statistic the random

1 match probability and the database match probability, correct?

2 A With clear statement as to what they mean.

3 Q Now are you aware of any articles discussing the NRC-2
4 recommendation that conclude the NRC-2 recommendation means to
5 ask two questions and provide two answers?

6 A Question was is there any article?

7 Q Are there any scientific articles that are published that
8 interpret the NRC-2 recommendation to be that you ask two
9 questions and provide two answers, the random match probability
10 and the database match probability?

11 A The DNA Advisory Board recommendation, which is --

12 Q Okay.

13 A -- published as material in Forensic Science
14 Communications.

15 Q And we have that as pretrial V.

16 A Yes.

17 Q Aside from that, do you know of any publications that
18 attempt to interpret NRC-2 as calling for two questions and two
19 answers?

20 A Not explicitly, no.

21 Q You're referring us to pretrial V, the DAB article. Who
22 wrote the section on database searches?

23 A The subcommittee of the DNA Advisory Board, the member --
24 and obviously after the subcommittee made a draft it was
25 presented to the entire committee, and the whole committee
26 endorsed it.

27 Q Who was the subcommittee?

28 A Subcommittee for writing this report included myself;

1 Bruce Budowle, B-U-D-O-W-L-E, member of the DNA Advisory Board;
2 then Barney Devlin, D-E-V-L-I-N, again member of the DNA
3 Advisory Board; and George Carmody, C-A-R-M-O-D-Y, an extra
4 person that the DNA Advisory Board invited.

5 Q Who was the extra person? Carmody?

6 A Carmody.

7 Q So you four wrote the database search section?

8 A Correct.

9 Q Who actually penned it? Who actually wrote the text that
10 ended up in that article?

11 A Well, I really can't answer that question because several
12 of us wrote drafts of several sections and paragraphs, and then
13 they were edited and discussed in at least two or three
14 meetings of the subcommittee members.

15 Q You said you presented a draft, presumably this draft, to
16 the rest of the DNA Advisory Board; is that correct?

17 A Correct.

18 Q Fair to say, though, the people who had written this were
19 the most familiar with population genetics issues?

20 A Yes.

21 Q So really it was the more experienced in population
22 genetics presenting to the less experienced in population
23 genetics?

24 A Correct.

25 Q And did they have any critical questions or criticisms?

26 A Well, apart from language, I don't remember any other.

27 Q Now your -- the way this is written, you understand --
28 you believe this suggests there should be two questions and two

1 answers?

2 A Yes.

3 Q Okay. Did you try to talk with any of the NRC-2 members
4 before you put forth your recommendation to see if they agreed
5 there should be two questions and two answers before you wrote
6 this?

7 A I do not know whether it was before we wrote or after we
8 wrote, but we sent these draft to at least the chairman of
9 NRC-2; namely, Dr. James Crow to make sure that that's what the
10 implication of the recommendation was.

11 Q Well, the bulk of the article essentially says we endorse
12 the NRC-2 approach, correct?

13 A Correct.

14 Q So Dr. Crow isn't going to have any complaints about
15 that, correct?

16 A If he found that discussions are not implicit in the
17 recommendation, he would have objected.

18 Q Does it say anywhere in this article, pretrial V, that we
19 understand or we interpret or we conclude that the NRC-2
20 recommendation calls for presenting two questions and two
21 answers to the fact finder? Does it anywhere say that
22 explicitly in your two and a half pages section on database
23 searches?

24 A No, we do not explicitly say that. But if you look at
25 the first paragraph of the database search issue, and then we
26 discuss later on that in the last paragraph, for example, that
27 you talk about likelihood ratio, Bayesian statistics, and we
28 clearly say that those require the answer of these two

1 questions and in addition several other assumptions. And if
2 one can make those assumptions you can go forward with using
3 answers of these two questions to formulate your likelihood
4 ratio and translate that into a posterior probability as the
5 Bayesians do.

6 Q I think we've already --

7 A We, as committee members, did not feel that the DNA data
8 has enough information to make those additional assumptions.
9 That's why we refrain from translating answers of question
10 number one or two to define strength or weight, whatever you
11 call it.

12 Q Okay. I believe we've already gone over the introductory
13 paragraph, two questions arise.

14 You mentioned somewhere else in that document, you
15 indicate that you suggest that the NRC-2 recommendation is
16 requiring two questions and two answers. Where does it
17 explicitly say that elsewhere in the document?

18 A Well, as I said, we did not explicitly say that in the
19 NRC-1 -- NRC-2, I mean -- requires two questions. But the
20 question -- answer to the question number two is the one that
21 NRC-2 recommends.

22 Q Okay. So you end up recommending the NRC-2
23 recommendation, meaning that you end up recommending that the
24 random match probability multiplied by N is an appropriate
25 statistic?

26 A For answering the question number two.

27 Q Okay. It doesn't explicitly say in here then that the
28 NRC-2 means two questions and two answers. Did the other three

1 authors ever explicitly state to you that it was their opinion
2 that there were two questions and two answers?

3 A Which are the three others that you're mentioning?

4 Q I believe Mr. Budowle, Devlin, and Carmody.

5 A Yes, they cosigned this document.

6 Q I know, but my question to you is this document doesn't
7 explicitly say we believe, we interpret, we conclude NRC-2
8 requires two questions and two answers. Did either
9 Mr. Budowle, Mr. Devlin, or Mr. Carmody explicitly -- not by
10 inference, explicitly -- say to you I believe or I interpret
11 NRC-2 requires two questions and two answers?

12 A I don't understand your question because we here say that
13 in the context of the database search these two questions can
14 emerge and here are the answers of these two questions.

15 Q I understand that.

16 A And if you look at NRC-2, we start with -- we endorse the
17 NRC-2 recommendation. So that immediately says that. And
18 particularly if you read the language on page 135 of NRC-2,
19 which cannot in any more explicit terms say that that's the
20 answer of question number two.

21 Q Okay.

22 A So if any member of the DNA Advisory Board was in
23 disagreement with our interpretation of NRC-2 recommendation,
24 it would have been reflected in the document.

25 Q Okay. Let me just confirm one more time. Your document
26 doesn't explicitly state anywhere that the NRC-2 recommendation
27 to present the random match probability and the database match
28 probability, does it?

1 A In NRC-2's recommendation?

2 Q Your document, pretrial V, the DAB recommendation,
3 guideline, does not explicitly state in there that the NRC-2
4 recommendation is to present the random match probability and
5 the database match probability, does it?

6 A No, it does not.

7 Q Okay.

8 A But it --

9 Q Did --

10 THE COURT: Let him finish his answer.

11 MR. LYNCH: I'm sorry.

12 THE WITNESS: But it explicitly says that what goes as
13 recommendation 5.1 of NRC-2 is the answer of the second
14 question.

15 Q (By MR. LYNCH) Okay. I understand that. And my
16 question for you is, did Bruce Budowle, Barney Devlin, or -- I
17 don't know his first name, Mr. Carmody, are explicitly tell you
18 I interpret NRC-2 to mean that you should present both the
19 random match probability and the database match probability?

20 A Answer is no, because I cannot ask them that question in
21 that terms. But if they had any objection, they would not have
22 cosigned that report.

23 Q Okay. Fair to say that --

24 A By the way, I did not write the language of paragraph one
25 or two. I think it came from either Barney Devlin or Bruce
26 Budowle.

27 Q Okay. Did you ever ask them to state exactly what they
28 meant by paragraph one and two?

1 A They mean what -- exactly what is written.

2 Q So you --

3 A -- the data can give us a profile and we can ask what is
4 the rarity of the profile and what is the chance of finding
5 such a profile if there are N persons searched.

6 Q Besides the other DAB members, was this paper peer
7 reviewed?

8 A This document, no, this is not a peer-reviewed
9 publication.

10 Q In fact --

11 A But this is what is called in government circles public
12 records. So whenever such a report is written and is to be
13 consumed by the public, the federal government puts that in
14 their public register and anybody can comment. This document
15 was made available to the entire SWGDAM community. As a
16 consequence, none of the practicing laboratories in the country
17 had any objection. And this is, in my opinion, generally
18 accepted protocol and standard operating procedures in this
19 country and worldwide.

20 Q You indicated it's not peer reviewed. I just want to
21 confirm the fact that the rest of the less qualified DAB
22 members didn't object to it, that doesn't make an item peer
23 reviewed, correct?

24 A Well, I would object to your wording of less qualified.

25 Q I understand.

26 A I don't think Nobel laureate and scientist Joshua
27 Lederberg (phonetic) can be called less qualified than me.

28 Q As far as the population genetics issues, I think we've

1 covered that they were less experienced in population genetics
2 issues. The fact that these people anyway reviewed it does not
3 make it peer reviewed, does it?

4 A It's not a peer reviewed document by standard meaning of
5 the term peer reviewed.

6 Q Now I believe you said when you testified for the
7 district attorney that this article, pretrial V, was a
8 clarification of the NRC-2 recommendation; is that fair to say?

9 A Yes, I would say so.

10 Q Who asked you to clarify that?

11 A Because the NRC-2 recommend -- who asked us to clarify?
12 None.

13 Q Okay. Does your document ever say that you're clarifying
14 the NRC-2 recommendation?

15 A It does not say so. But DAB -- charter of DAB was to
16 come up with a guidelines that the forensic community agrees
17 with and can practice. We found that there was statements in
18 the NRC-2 report that could be misinterpreted because of
19 generality or nonspecificity. So we thought that if we were to
20 write a document that will make things easier to understand,
21 that would be among our charter. And that's exactly what we
22 did. We did so for writing the standards of genotyping, we did
23 so in order to set the guidelines of how and to what extent
24 offenders databases can be use. And third, we did deal with
25 the statistical issues exactly with a similar philosophy, to
26 make them -- to express them in simpler languages so that they
27 would be easier to implement, to spell out the underlying
28 premises, and to say what else can be done if and when you're

1 allowed to make additional assumptions.

2 Q So fair to say in summary, you were given the mandate of
3 providing some guidelines on statistics and population genetics
4 issues and you sat down and you came up with this document
5 specifically finding database searches to be a topic that
6 needed to be addressed?

7 A Correct.

8 Q There's a third approach, I believe we've touched upon it
9 before, touted by Balding and Donnelly, Evett and Weir that
10 suggests in essence that the evidence in fact is stronger when
11 you have a database case because there have been so many
12 exclusions?

13 A Correct.

14 Q Okay. So you understand what I mean then when I'm
15 talking about the evidence becoming stronger means the evidence
16 implicating a particular defendant is stronger.

17 A Stronger under certain assumptions, yes.

18 Q Okay. Fair to say that the general thrust of this
19 approach is opposite in direction to the NRC-2 recommendation
20 and Stockmarr's attitude that the evidential weight becomes
21 weaker in a cold hit case?

22 A Well, if you can make the additional assumptions, yes.
23 You have to define -- when commentators translate frequency or
24 probability of certain events into a likelihood ratio or a
25 posterior probability, they make additional assumptions, some
26 of which are standard in statistical circles. But in the
27 context of calling them strength or weight has to be really
28 understood in that specific context. If you pull them out of

1 the context then you may be equating apples and oranges.
2 Because as probability of an event or chance of a rarity of a
3 profile, you list certain assumptions. And we have spent more
4 than half of our lifetime in examining that adequacy or
5 accuracy of those assumptions.

6 Now you come up with other concepts like weight or
7 strength, hidden under which are assumptions which are
8 non-genetic, non-statistical, and I cannot give any statement
9 under oath about how comfortable I should be with them.

10 Q When you're talking about certain assumptions, it's fair
11 to say the people endorsing the third approach suggest that the
12 strength of the evidence is tied with the prior probability or
13 prior odds?

14 A Correct.

15 Q Which is the figure that you're not comfortable
16 estimating or predicting?

17 A Right.

18 Q And in fact, the chapter written by Evett and Weir
19 explicitly suggests that the Bayesian view using prior odds and
20 posterior odds is an unavoidable requirement in analyzing DNA
21 evidence?

22 A They say so, yes. But in my opinion I don't think it is
23 correct.

24 Q Okay.

25 A Unless you can allow me to make an assumption, with which
26 I would totally object, that I had the same prior odds of
27 depositing my DNA in that crime scene.

28 Q Okay.

1 A I think you will also make the same objection as mine.

2 Q You're talking about the conceptual difficulty in
3 figuring out what the prior probability is for an individual?

4 A Right.

5 Q If for example we were on an island of a hundred people
6 and somebody stole a wallet, you might be able to conclude that
7 each person is as likely as the other, so there's a one in a
8 hundred chance that it was Mr. Lynch?

9 A Yes. I would have difficulty with that statement also if
10 I was on the island because I don't look at somebody else's
11 purse or wallet.

12 Q Okay. That's a cleaner example than maybe the example
13 where you have on an island a hundred people but five of them
14 have a history of theft?

15 A Right.

16 Q Is that the problem that comes into play when we're
17 dealing with the prior probability?

18 A Yes.

19 Q Is estimating the prior probability?

20 A Correct.

21 Q Some people do endorse the concept, however, of using a
22 prior probability as one over the suspect population, meaning
23 either the population of the city, the county, or the state, or
24 even the country? Some put forward that theory, correct?

25 A Yes. I totally object to that.

26 Q And you object to it on the grounds that you can't really
27 estimate the prior probability of the suspect?

28 A Correct.

- 1 Q Okay. Now the people who support this third approach,
2 one of them is Mr. Donnelly?
- 3 A Yes.
- 4 Q He's a reputable scientist, correct?
- 5 A Yes.
- 6 Q Eminently qualified?
- 7 A Yes.
- 8 Q Widely acclaimed?
- 9 A Yes.
- 10 Q Published in prestigious journals?
- 11 A Yes.
- 12 Q Holds a position at a respectable university?
- 13 A Yes.
- 14 Q What about Mr. Weir? Is he --
- 15 A Same. All of those apply to him too.
- 16 Q Okay. And Mr. Balding?
- 17 A I would say mostly applies to that too.
- 18 Q Mostly. You have some reservations about Mr. Balding?
- 19 A Yes, because at times his way of disagreeing with others
20 is not as professional as it can be.
- 21 Q Okay. So you agree that he's renowned, eminently
22 qualified, and widely acclaimed, you just disagree -- you just
23 consider his writing style to be less than professional?
- 24 A Right.
- 25 Q In what regard? What are you relying on? These
26 particular cases, or some other writings?
- 27 A Not this particular case per se. For example, when we
28 objected in scientific meetings that the validity of those

1 prior assumptions, while Dr. Weir and Peter Donnelly said that
2 yes, that's a very -- that could be a very unreasonable
3 assumption, now Balding's answers were much more sarcastic.

4 Q Okay. So it's just a personal --

5 A Personality. I don't -- I mean he's -- to make a long
6 story short, he is also equally -- he's also equally competent
7 statistician, but makes the same assumptions as others.

8 Q He doesn't deny that he's making those assumptions,
9 though, correct? He just --

10 A He does not deny that he's making those assumptions. But
11 he thinks that he can make those assumptions.

12 Q Now you know somebody named Foreman who was also -- I
13 believe it was a cite in your article. Foreman, one of the
14 articles you relied on. I don't know that I have the article
15 written by her.

16 (Off-the-record discussion between attorneys.)

17 Q (By MR. LYNCH) In the DAB article that I put down you
18 cite an article by -- I think it's Balding, Donnelly, and
19 Foreman. Do you know who this person is?

20 A The DAB article and the Foreman article.

21 MS. SCHUBERT: It's Evett, Foreman, and Weir in
22 Biometrics.

23 MR. LYNCH: Which page is it on?

24 MS. SCHUBERT: The last page under the references.

25 THE WITNESS: Yes, we cited their article.

26 Q (By MR. LYNCH) Do you know who Ms. Foreman is?

27 A She is at present one of the -- one of the administrators
28 in National Institute of Justice.

1 Q Do you know what her background is as far as
2 qualifications?

3 A Well, she's trained in molecular biology and DNA
4 techniques. She probably had some training in population
5 genetics also. She earlier worked in Cellmark in their DNA
6 unit and from there moved on to National Institute of Justice
7 DNA research programs.

8 Q Now presumably she has some training in population
9 genetics if she's coauthoring with -- did we decide it was
10 Balding and Donnelly?

11 A I believe so, yes.

12 Q You don't know her training in population genetics?

13 A No, I don't know the extent of her population genetic
14 training.

15 Q Fair to say, though, if she is cited as a coauthor she
16 also endorses the views of that paper which supports this third
17 approach?

18 A Yes. I have not personally spoken to her about this
19 subject.

20 Q Now you're aware that when the Evett and Weir chapter
21 nine discusses the issue of cold hits, it says their
22 formulation is in direct contradiction with the NRC, meaning
23 the NRC-2's recommendation, and furthermore that the NRC,
24 meaning the NRC-2, does not give a sensible answer. You're
25 aware of that criticism?

26 A Yes, I'm aware of that. But you cannot pull that out of
27 the context of the rest of chapter nine. If you read the rest
28 of chapter nine, you will see that they're making the

1 assumption of apriori which puts you and me also in the crime
2 scene.

3 Q I understand. And you disagree with that concept?

4 A Yes.

5 Q My point is, though, that they are encapsulating their
6 recommendation as being in direct contradiction with the NRC-2.

7 A If you make those additional assumptions, yes.

8 Q Which they do.

9 A Yes.

10 Q Okay.

11 THE COURT: When you said they are making the assumption,
12 was the term apriori, or what was the term which puts you and
13 me also in the crime scene?

14 THE WITNESS: Correct.

15 THE COURT: Apriori.

16 THE WITNESS: Yes.

17 THE COURT: Okay.

18 Q (By MR. LYNCH) Apriori, meaning before we know anything
19 else?

20 A Correct.

21 Q And they actually say that the NRC-2 recommendation does
22 not give a sensible answer?

23 A That is the language. You have to remember one more
24 thing that when people are making those statements, they all
25 ignore the scientific accuracy of the English expression of the
26 term N times P, or DMP.

27 Look at page 135 of NRC-2. When they say the probability
28 cannot exceed this, they are not saying the probability is

1 exactly this. So that means you can say that I am an Indian
2 and no Indian has ever recorded to be of height taller than 7
3 foot 6 inches, so my height should be less than 7 foot
4 6 inches. That does not make me immediately recruitable by
5 Sacramento Kings as the center of next year.

6 Q I understand.

7 A So all of them are making the same mistake. They're
8 saying -- when Donnelly and Balding says that NRC
9 recommendation can be less powerful because there are hundreds
10 of persons who were excluded in the database search, they
11 forget that NRC did not recommend that NP is the correct
12 probability. It cannot exceed. So it can be overly
13 conservative.

14 Now what Dr. Weir and Evett are doing, they're saying
15 that let us now use a prior that everybody in the world had the
16 same chance of depositing their DNA in the crime scene. Using
17 that as a prior, we can show that weight or strength of the DNA
18 evidence as given by NRC-2 is very unreasonable.

19 Q So are you saying that Balding an Donnelly and Evett and
20 Weir are mistaken?

21 A In my opinion, yes, in assuming that is a correct prior
22 probability to be used.

23 Q Okay. But are they mistaken, given that they don't
24 actually necessarily endorse a particular number or a
25 particular method for finding a prior probability, given that
26 they just in essence put forward that a prior probability is
27 necessary to complete the calculation, are they mistaken in
28 that?

1 A I think so, because they are equating NRC-2's
2 recommendation as their definition of strength or weight. I
3 don't think NRC-2's recommendation of 5.1 is defining the
4 strength or weight in the sense Weir or Donnelly or Balding are
5 using.

6 Q Now Mr. Dawid writes a letter in response to
7 Mr. Stockmarr's article and characterizes Mr. Stockmarr's
8 article as being essentially in agreement with NRC-2; is that
9 fair to say?

10 A Yes.

11 Q And he then goes on and says -- is that a fair and
12 accurate portrayal of Mr. Stockmarr's position?

13 A Yes.

14 Q And he then goes on to say that Mr. Stockmarr's position
15 is in serious conflict with other treatments, correct?

16 A Yes, he mentions that.

17 Q And you would agree with that?

18 A I agree with his -- with your question that yes, that's
19 what Mr. Dawid says. I do not agree with his -- I do not
20 consider his statement scientifically valid.

21 Q Who is Mr. Dawid?

22 A I really do not have any idea about his background.

23 Q Now Mr. Balding in his article says that recommendation
24 5.1 of the NRC-2 is based on flawed intuition and misconceived
25 analyses.

26 A Yeah, that's the language -- that's the reason why I
27 don't like Balding.

28 Q Okay.

1 A That's a very serious complaint without characterizing
2 what -- or what his reasonableness is.

3 Q Okay. You would agree that's a serious criticism to say
4 something is --

5 A Yes, serious --

6 Q -- flawed intuition and misconceived?

7 A -- serious, and scientifically flawed criticism.

8 Q You disagree with his reasoning, but the criticism is
9 severe, correct?

10 A Yes.

11 THE COURT: Wait a minute. You disagreed with his
12 reasoning?

13 THE WITNESS: Correct.

14 THE COURT: Okay. That's one idea. And you also dislike
15 the severity with which he comments or characterizes other
16 persons' positions?

17 THE WITNESS: Correct.

18 THE COURT: Okay.

19 THE WITNESS: Because -- let me explain why. Because
20 he -- when he says -- when he uses that language, the validity
21 of his statement would be true in even more concocted,
22 pathological, and unreasonable assumptions. His statement
23 would be scientifically valid if he is allowed to make other
24 assumptions which are much more derogatory than the ones used
25 in NRC-2.

26 Q (By MR. LYNCH) Would it be fair to say that when he
27 accuses NRC-2 of using flawed intuition that you would consider
28 that his intuition is flawed instead?

1 A For much stronger grounds.

2 Q And when he criticizes the NRC-2 as having misconceived
3 analyses, you would counter that you think his analyses are in
4 fact more misconceived?

5 A Correct.

6 Q You appreciate the objections he has with NRC-2, you just
7 think his approach has more objections?

8 A Yes.

9 Q You said that cold hit statistics were presented by
10 Mr. Weir at the Promega conference; is that correct?

11 A Yes.

12 Q You can't remember which year?

13 A I don't remember which year.

14 Q What was the topic of the talk?

15 A I don't remember that exactly.

16 Q Okay. Was it a talk on the cold hit statistics or was it
17 a talk on something else that he mentioned?

18 A Well, if I remember correctly, it was more general. He
19 probably was commenting on in general about NRC-2
20 recommendations. He went to the -- he ranged from topics such
21 as difference between recommendation 4.1 and 4.2 and then the
22 issue of a cold hit or database search, and also dealt with
23 other issues such as whether or not the error rates should
24 enter into calculations or not. So it was broader than simply
25 cold hit statistics.

26 Q That was a general talk. Do you know how much -- the
27 period of time he spent on talking about cold hit statistics?

28 A I would say about -- I don't remember. Maybe one third

1 or one fourth of his 25 or 30 minute talk.

2 Q One half or one third of his 20 minute or 30 minute talk?

3 A Yes.

4 Q Okay. What was his -- what was his input on that? Was
5 he talking about -- well, it's Mr. Weir, so was he talking
6 about the Bayesian approach?

7 A Basically his chapter nine, that section.

8 Q He was trying to sell or convince people that this was
9 the correct approach?

10 A Yes.

11 Q Okay. Did that spark a debate?

12 A Yes. Because several of us commented as to whether or
13 not -- or what other assumptions he is making. And he admitted
14 that he was using the equal prior and everybody in the
15 population had the same chance of depositing their DNA. And
16 when we asked suppose I tell you the statistic that 66 percent
17 of the violent crimes are perpetrated by repeat offenders would
18 he change his prior. He said yes, he would change his prior.

19 Q So when you said that, you questioned him, did you
20 question him in sort of the public, formal presentation or was
21 it sort of an after-the-fact, behind-the-scenes type of --

22 A Well, not only when such meetings are held after
23 everybody's presentation there are times of comments and
24 discussions, and again after their whole session of a
25 particular theme there is again time of discussion or comments,
26 and such statements were made in that context.

27 Q You said --

28 A Some of the comments also are made in corridors during

1 coffee break or lunch break.

2 Q But there was a debate during the question-and-answer
3 period of Mr. Weir's presentation?

4 A Yes.

5 Q Okay. And different people had different viewpoints on
6 whether or not it was appropriate to present a prior
7 probability and, if so, how to calculate the prior?

8 A Yes.

9 Q Okay. Some people in support of the method, some people
10 in disagreement with it?

11 A Yes.

12 Q Okay. Did you ever do a survey to find out how many were
13 in agreement with Mr. Weir and how many were in disagreement?

14 A No, I did not, because I think that I had better things
15 to do.

16 Q Okay. I understand. Now at some point in time you
17 have -- you have read, maybe some time ago now, a
18 prepublication manuscript written by Lawrence Mueller and
19 William Thompson; is that correct?

20 A I don't understand your question. I review more than
21 60 papers a year. I do not know what you're referring to.

22 Q I'm referring to a -- not an instance when you were
23 actually a journal peer review, but you were sent something
24 from Mr. Daiger, D-A-G -- excuse me, D-A-I-G-E-R, a work by
25 Mr. Mueller and Thompson in which Mr. Budowle was listed as the
26 coauthor since he had gathered and provided data that
27 Doctors Mueller and Thompson were reviewing. Do you remember
28 that?

1 A Yes, I vaguely remember. That was long time back, about
2 ten or twelve years back.

3 Q Might be a while back.

4 THE COURT: Which Thompson are we talking about?

5 MR. LYNCH: I believe it's William.

6 THE COURT: Is that doctor?

7 MS. SCHUBERT: He's an attorney, Judge. A defense
8 attorney.

9 THE COURT: But you referred to him as Dr. Is that --
10 does he have a JD? Is that how he gets Dr., the way I do?

11 MR. LYNCH: I believe he's a doctor of philosophy.

12 MS. SCHUBERT: Psychology, I believe.

13 THE COURT: That's it. Psychology.

14 THE WITNESS: I think he has a JD degree also.

15 THE COURT: Well, us JDs don't call ourselves doctors
16 very often.

17 Q (By MR. LYNCH) Looks like we're referring back to a
18 letter you wrote to a Dr. Stephen Daiger, D-A-I-G-E-R.

19 A Yes, this is a document of 1989. December 28th.

20 Q And so, again, this was regarding a work in which
21 Dr. Mueller and Thompson had been coauthoring a scientific
22 publication on some of Mr. Budowle's data; is that correct?

23 A Yes.

24 Q And in the last paragraph -- maybe I should put this on
25 the screen so the Court can see. Why don't I get you to review
26 the last paragraph where it says however, I shall be interested
27 in his work and any data he wishes to submit.

28 I'm confused. Are you talking about -- with the he, are

1 you talking about interested in Mueller's work --

2 A Yes.

3 Q -- and Mueller's data?

4 A Yes.

5 Q You hope that we can collaborate, you're hoping that you
6 and Dr. Mueller can collaborate in the future?

7 A Yes.

8 Q Elsewhere in the letter you're critical of Mueller's and
9 Thompson's transcript, correct?

10 A Yes.

11 Q Why is it that then that you hope to -- you're interested
12 in his work and data that he wishes to submit?

13 A Why I am interested?

14 Q Yeah.

15 A Because at that time in 1989 there were not much inter --
16 world wide population data. And if what Dr. Mueller was
17 suggesting in that paper is correct, I could have collaborated
18 with him to tell him what appropriate genetic distance measures
19 would be so that we can use the databases to compute them.

20 Q So when I read this, I read that I should be interested
21 in his work and any data he wishes to submit, you were
22 referring to Dr. Budowle's data and work. Feel free to read
23 the whole letter if you want to get a sense of that.

24 THE COURT: Well, here's the reference that was -- oh,
25 you have the pointer.

26 MR. LYNCH: He has the actual letter, your Honor.

27 THE COURT: Oh, okay.

28 THE WITNESS: Yeah, I think the -- sorry. In fact, I

1 made a similar request to Dr. Mueller also. In this paragraph

2 I was referring to Dr. Budowle, right.

3 Q (By MR. LYNCH) So in the paragraph that begins however,

4 I shall be interested in his work and any data, you are

5 expressing interest in working with the data of Bruce Budowle?

6 A Correct.

7 Q That Larry Mueller was working on?

8 A Right. Because by that time, since it was known that

9 Budowle was withdrawing from that work, I presumed that

10 Dr. Budowle had serious objection about the treatment of the

11 data as the other two coauthors did. So I was -- I was trying

12 to find out if Budowle had other data so can be used to support

13 his reasoning for withdrawing.

14 Q Okay. When you're talking about the data that you're

15 interested in, you're talking about the same data that

16 Dr. Mueller and Thompson had worked on?

17 A Same. And I knew that Bruce at that time -- Bruce

18 Budowle I mean -- at that time was also collecting other world

19 wide data. I expressed that interest of scientific

20 collaboration.

21 Q But in the paragraph further up you enclosed a review and

22 in summary on this letter said the work is based on an

23 inappropriate estimation procedure and uses comparisons that

24 defy simple population genetic principles, correct?

25 A Correct.

26 Q Okay. So in one paragraph and presumably an attached

27 review you sent to Dr. Budowle, you criticize Mueller and

28 Thompson's work, correct?

1 A Yes.

2 Q And yet in the last paragraph you express interest -- you
3 suggest in other paragraphs that he withdraw working with
4 Mueller and Thompson, correct? You feel that Dr. Budowle is
5 completely justified in withdrawing from this work?

6 A Right.

7 Q Okay. And yet in the last paragraph you express interest
8 in working --

9 A With Budowle.

10 Q You express interest in working with the data that
11 Mueller and Thompson had been work working on. Isn't that a
12 conflict of interest to try and get somebody to withdraw
13 cooperation from some project and then have them provide that
14 data to you so that you can publish it in that field?

15 A That's exactly how science progresses. If somebody
16 wrongly analyzes the data and you have reason to believe that
17 wrong analysis has been done, science progresses by showing and
18 reanalyzing that data in the correct way to say that the
19 scientific fact and the one published before or presented
20 before is wrong for such-and-such reason. This is how science
21 proceeds.

22 Q I understand that's how science proceeds if it gets
23 published. But you've recommended that Dr. Budowle or agree
24 that Dr. Budowle should withdraw his cooperation --

25 A No, I --

26 Q Hang on. Withdraw his cooperation and, instead, you
27 should be able to work on that data. Now aren't there ethical
28 rules for scientists that forbid that kind of poaching of

1 information?

2 A Let me -- why don't you look at paragraph number two. I
3 find the manuscript disturbing for several reasons. And I feel
4 that Dr. Budowle is completely justified in withdrawing from
5 this work. So the fact that Bruce Budowle did not agree with
6 what other contributors of that work had done, I justified that
7 this is by no way saying that I am telling Budowle to withdraw
8 from this and work with me.

9 Q Well, you do say that this work should not be published
10 in any journal, but at the end, I'd like to work on the data;
11 implying work on the data and publish myself, correct?

12 A Among other things.

13 Q Okay. Science doesn't normally progress by people
14 attacking articles before they're published? The normal
15 scientific discourse is to allow it to be published, if indeed
16 it survives peer review, and then to use that data if it's
17 publicly available and come up with a contrary conclusion and
18 publish that way, correct?

19 A Let me put this letter in the proper context. I am not
20 here to character assassinate anybody. This paper -- so-called
21 manuscript being talked about, it is data of Dr. Bruce Budowle
22 obtained by Dr. Mueller through court discovery motions, and
23 then Dr. Mueller and his coauthor attempted to write it up and
24 send it to a journal without Bruce Budowle's even knowledge.
25 This manuscript attempt came to my attention from Dr. Daiger,
26 who was a colleague of mine at Houston -- this is a manuscript
27 that Budowle is disowning now, can you review it for me and
28 give me some comments.

1 I was working with Bruce Budowle already by that time on
2 RFLP loci and several issues. So when I looked at Budowle's
3 views, I wrote Steve back saying that Bruce is completely
4 justified in disassociating his name from this. Now the
5 manuscript, as it stands, I would not recommend publication in
6 a journal. But if such issues come and Bruce has data of this
7 type, I will be more than happy to collaborate with him to say
8 what is the difference between eastern and western Hispanics in
9 this country. Because I am -- two of my graduate students were
10 already working on -- were using Hispanic populations as a
11 vehicle of understanding complex diseases. So I would have
12 been delighted to see what is the difference between eastern
13 and western Hispanic populations in the country at
14 hypervariable loci.

15 Q But you weren't already working on this very set of data
16 that Budowle and Mueller were working on, correct?

17 A Budowle and Mueller were not working on any data
18 together. Mueller obtained the data through court discovery to
19 be used in a particular case. And he used that data to write
20 up a manuscript and send it to a journal without the coauthor's
21 knowledge or permission.

22 Q Okay. You weren't already working on this data with
23 Bruce Budowle --

24 A I don't --

25 Q -- at that point?

26 A I don't remember what data set that particular manuscript
27 described. But by that time we were -- Dr. Budowle and myself
28 were already working on the RFLP databases being generated by

1 the forensic community.

2 Q Are you saying that you don't know whether this data was
3 already data you had access to?

4 A I don't recall.

5 Q Why are you expressing interest in the data if you
6 already have access and are working on it?

7 A Because by that time I was already working with several
8 SWGDAM laboratories, I had already data from Orange County, I
9 had already data from Miami Dade County. I wanted to make sure
10 that if Dr. Mueller's claim is correct, if done properly.

11 Q Well, it was clear which data Mr. Mueller and
12 Mr. Thompson were working on because you read the manuscript
13 they were attempting to publish, correct?

14 A I don't recall what exactly data set they were
15 specifically discussing in that paper.

16 Q What was your basis for believing that Mr. Budowle had
17 not -- or his agency had not given permission for
18 Misters Mueller and Thompson to work on the data?

19 A I don't -- can I get your question again?

20 Q You said that Dr. Budowle had not given Larry Mueller
21 permission to work -- or that the agency had not given
22 permission for Larry Mueller to work on these documents. You
23 testified to that just now.

24 THE COURT: Well, on these documents, what --

25 MR. LYNCH: Excuse me.

26 THE COURT: -- what are you talking about?

27 MR. LYNCH: Excuse me. On these data.

28 Q You testified earlier that Dr. Mueller was working on

1 data that he obtained through discovery and that he did not
2 have permission to use.

3 A I did not say -- testify to that.

4 THE COURT: I don't believe he testified to that.

5 MR. LYNCH: Okay.

6 THE WITNESS: I did not testify that.

7 Q (By MR. LYNCH) You said that he did not have
8 Mr. Budowle's permission.

9 A Just read back what my answer was. I did not say that.

10 Q Okay. So your criticism then of the manuscript was
11 not -- well, you talked about when he was withdrawing from his
12 participation in the work, did you not make some statement to
13 the effect that Lawrence Mueller had gotten the data and did
14 not have permission to use it?

15 A No, I did not say --

16 THE COURT: He said Dr. Mueller had gotten the data by
17 cold discovery.

18 THE WITNESS: Court discover. Court discover. Court
19 discovery motions.

20 THE COURT: Cold as distinguished from hot?

21 MR. NELSON: Court.

22 MS. SCHUBERT: Court.

23 THE COURT: Court discovery. He got it from court
24 discovery.

25 THE WITNESS: Yes.

26 THE COURT: How would he get court discovery? What does
27 that mean?

28 THE WITNESS: Well, right from 1986 when DNA evidence had

1 been discussed in court, very often some experts demanded the
2 raw data for examination.

3 THE COURT: Who demanded the raw data?

4 THE WITNESS: I do not know the specifics of this. But
5 considering the context, I think it was RFLP databases that a
6 laboratory had generated. And by court discovery motions those
7 were made available to the defense experts.

8 Q (By MR. LYNCH) Now you would agree that there are --

9 A Let me finish. Dr. Mueller, Dr. Thompson -- or
10 Mr. Thompson, whatever you want to call him -- has no
11 experience of doing ever any DNA typing themselves or
12 generating DNA databases. So all of their so-called research
13 on DNA databases are databases that they obtained from others.

14 Dr. Mueller's publications do not ever reflect that he
15 had ever collaborated with any scientist who generates their
16 own DNA data. All of his DNA publications come from his
17 examination of databases that have been submitted in court
18 under discovery motions.

19 So the statement that I made in this paper is clearly to
20 be put in the context that when I see a manuscript coauthored
21 by these persons, two of whom have never done any work in this
22 subject and the third author is the only one who could have
23 supplied the data, the statements are made in this context.
24 And before writing this letter I was aware that Bruce Budowle
25 had withdrawn his name from that paper.

26 So all of this letter says is yes, I have seen -- I have
27 now read the paper. Since you tell me that Bruce Budowle has
28 withdrawn his name, I think his judgment is right. Second, I

1 say that the manuscript is disturbing for -- on a number of
2 respects, and in particular since I work on that subject before
3 I knew what kind of genetic distance measures are to be
4 employed in RFLP loci. And since Budowle was academically
5 closer to that data, I was requesting to Daiger to say that if
6 Budowle were to get any supplemental data analyzed, I would be
7 more than happy to collaborate with him.

8 Q When you were asking if Budowle wants to send you the
9 data, you would be researching it for the same purpose and
10 topic as the manuscript that Doctors Mueller and Thompson?

11 A One being that as our 13 or 14 years research now that we
12 have, Budowle and myself has researched collaborations, that go
13 well and beyond the issues that was portrayed in that
14 manuscript.

15 Q It's true, though, that scientists are generally
16 forbidden from reviewing papers when they have a competing
17 interest in publishing on the same topic, correct?

18 A It was not a review for a journal. It was a manuscript
19 that Daiger's friend Budowle sent to him with probably request
20 you can read it or show it to your colleagues saying that am I
21 justified in withdrawing my name from there. It is not a
22 review of any scientific journal. It is a formal letter
23 written from me to my colleague in the same department who was
24 asking can you put it in writing because it -- so that your
25 comments I can send to Budowle. It is not a --

26 Q Fair to say --

27 THE COURT: Just a second. Let the doctor finish.

28 THE WITNESS: It is not a review of a scientific paper

1 from a journal. It was a review of a manuscript shown to me by
2 my friend Steve Daiger with the information that one of the
3 coauthors, who is not a population geneticist, he for some
4 reason wants to withdraw his name from there. Can you judge
5 whether this manuscript his judgment is correct or make any
6 other comments on the manuscript.

7 Q (By MR. LYNCH) I understand, and my question is --

8 A This is how we establish our scientific collaboration.
9 We go for a project which is -- which describes the problem,
10 the state of the art problem of the subject at that time, and
11 identify through that funding sources for getting our future
12 projects funded.

13 Q Are there not ethical rules in the scientific community
14 that forbid a person from undermining or criticizing another
15 person's work with the end result that that person criticizing
16 gets access to the data so that they can publish in that same
17 area? Are there not ethical rules forbidding that?

18 A Yes, there are ethical rules.

19 Q And it would be fair to say that you could see that
20 asking for the data in the same letter that you attach a
21 criticism of the work is violating that ethical principle?

22 A I don't think so.

23 Q Okay. I believe we found the language that you used
24 before. I was using the word permission, but you did state
25 that Doctors Mueller and Thompson had obtained the database
26 information without the knowledge of Mr. Budowle; is that
27 correct?

28 A I didn't say that. They got the data on the court

1 discovery motion for a particular case. That's the statement I
2 make.

3 THE COURT: Is it appropriate to use this data obtained
4 for court purposes, I assume so that one can respond to the
5 testimony of some other expert, is it appropriate to use data
6 obtained through a court order relating to a given case to then
7 utilize that data in the preparation of an article for
8 publication?

9 THE WITNESS: In scientific circles -- I do not know what
10 the court rulings are. In scientific circles, if somebody --
11 if you want some data from me to form the background or
12 foundation of a testimony I have given, I'll give you that data
13 for that specific case work. But I will write you a letter
14 saying that if somebody uses this data to write a scientific
15 publication, he or she needs to contact me.

16 THE COURT: And get your approval.

17 THE WITNESS: Get my approval.

18 THE COURT: And your agreement.

19 THE WITNESS: Yes. Because I may have not published all
20 I could have done with that data. You relied on my expertise
21 to -- for finding validity of the scientific statement I made.
22 You have every right to ask for foundation. And I would be
23 more than happy to provide you any data needed. But to the
24 extent that that data would be used for that litigation purpose
25 only. For any other purpose, the provider -- the receivers of
26 that data has to seek permission from me. Because I am
27 providing you sometimes data that would be worth examining by
28 me or my students for years to come. I do not want other

1 scientists to take that priority away from me.

2 THE COURT: All right. It's 12 o'clock. Let's come back
3 at 1:30.

4 MR. LYNCH: I'm going to ask to get this marked. Should
5 I do this now since we've talked so much about it?

6 THE COURT: Yeah, we'll do that.

7 We have an exhibit to mark, and we're in recess until
8 1:30.

9 ---o0o---

10 (Proceedings recessed to 1:30 p.m., this department.)

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1 MONDAY, JANUARY 27, 2003

2 AFTERNOON SESSION

3 ---oOo---

4 The matter of the People of the State of California
5 versus Paul Eugene Robinson, Defendant, Number 00F06871, came
6 on regularly this day before Honorable Peter Mering, Judge of
7 the Sacramento Superior Court District, State of California,
8 sitting in Department 30.

9 The People were represented by Anne-Marie Schubert,
10 Deputy District Attorney.

11 The Defendant, Paul Eugene Robinson, was not personally
12 present but was represented by David Lynch, Assistant Public
13 Defender and Robert Nelson, Assistant Public Defender, as his
14 counsel.

15 The following proceedings were then had:

16 THE COURT: Okay. The record will show all necessary
17 parties are present. Dr. Chakraborty has resumed the witness
18 stand.

19 Mr. Lynch, you may continue.

20 MR. LYNCH: Thank you.

21 CONTINUED TESTIMONY OF

22 RANAJIT CHAKRABORTY, witness called on behalf of the People,

23 RESUMED CROSS-EXAMINATION

24 BY DAVID LYNCH, Assistant Public Defender, Counsel on behalf
25 of the Defendant:

26 Q. Doctor, I assume you are familiar with the article
27 marked as pretrial MM by Lewontin and Hartl?

28 A. Yes.

1 Q. That appeared in the 1991 issue of Science; is that
2 correct?

3 A. Correct.

4 Q. And you were asked to formulate a response to go in
5 that same issue; isn't that fair to say?

6 A. Yes.

7 Q. And that would be the item pretrial NN, um, by yourself
8 and Mr. Kidd?

9 A. Dr. Kidd, yes.

10 Q. Okay. Um --

11 THE COURT: Now, this was in response to what article?

12 MR. LYNCH: This was in response to a article by
13 Lewontin and Hartl.

14 Q. (BY MR. LYNCH) Actually, isn't it correct, Doctor,
15 these both appeared in the same issue of Science?

16 A. Yes.

17 Q. And the gist of your article was to rebut the arguments
18 made by Lewontin and Hartl and say that the DNA typing
19 concerns may not be as significant as Lewontin and Hartl were
20 claiming, correct?

21 A. Correct.

22 Q. And Science, it is fair to say, is an important and
23 prestigious journal?

24 A. Yes.

25 Q. And other scientists will rely on the findings or
26 experimental results that you and other authors report?

27 A. Yes.

28 Q. Okay. Now, you report in that paper on page 1738, Even

1 within the Karitiana sample which contains many pairs of
2 individuals more closely related than --

3 THE COURT: Let's -- can you put your finger somewhere?

4 MR. LYNCH: I'm sorry.

5 MS. SCHUBERT: Your Honor, I will object to the
6 relevance of these articles.

7 MR. LYNCH: The relevance will be apparent in just a
8 minute, your Honor.

9 THE COURT: We will proceed a little while.

10 Q. (BY MR. LYNCH) Parenthesis 47 following that, Even
11 within the Karitiana sample, which contains many pairs of
12 individuals more closely related than full siblings, there
13 were no two individuals with identical VNTR profiles?

14 A. Correct.

15 Q. Okay. Now, the reason that sentence is in there is to
16 bolster the claim that substructures within an Indian tribe
17 such as Karitiana does not result in duplicate, in five or
18 six loci profiles, correct?

19 A. Yes, between unrelated individuals.

20 Q. Okay. And your statement was that even within that
21 small Karitiana sample where there are closely related
22 siblings there were no two individuals with identical VNTR
23 profiles, correct?

24 A. Yes. We made that statement in 1992.

25 Q. '91, right?

26 A. 1991. Sorry.

27 Q. Okay. Before you published this fact who reviewed the
28 Karitiana data to see if they were matching profiles?

1 MS. SCHUBERT: I will object to relevance again, Judge.

2 We have already established in California that the random
3 match probability is generally accepted, and I'm not sure how
4 this has anything to do with cold hit cases.

5 MR. LYNCH: It will become apparent in two questions,
6 your Honor.

7 THE COURT: I will give you two questions.

8 Q. (By MR. LYNCH) Before you published this fact who
9 reviewed the Karitiana data to see if there were any matching
10 profiles?

11 A. The Karitiana data was generated by Ken Kidd and his
12 colleagues. I -- I relied on his expertise to agree with
13 this statement.

14 Q. Okay. Did you write the statement or did he?

15 A. The statement, I believe, was written by Ken Kidd and
16 since he is the originator of the Karitiana database I agreed
17 with -- I relied on his expertise.

18 Q. You didn't review the data yourself?

19 A. No. By then I did not, no.

20 Q. Okay. Even though you weren't a co-author you were
21 listed as the principal author of this document, correct?

22 A. Yes.

23 Q. When did you first realize that this fact was actually
24 incorrect?

25 A. I don't remember exactly but several months after
26 publication of this paper.

27 Q. Okay. When you realized it was incorrect, did you
28 attempt to retract this false assertion of fact?

1 A. Yes. I commented on it in other papers.

2 Q. Can you give me a citation to where you explicitly
3 mentioned that there was an error in your article and you
4 were correcting that error?

5 A. There is nothing described in that terms, but I did
6 report Karitiana database in, um -- couple of examples. In
7 one case it is full siblings of an uncle/niece marriage,
8 there is duplicate profiles at six loci.

9 Q. Did you ever explicitly acknowledge that there was an
10 error in the article that you were the principal author of
11 when you, in fact, found out there was an error?

12 A. Yes. I said in many courts this is an error.

13 Q. No, not in courts. I wonder if you ever tried to tell
14 the scientific community that your claim in your article in
15 Science was incorrect?

16 A. That statement is incorrect. I made that statement in
17 several scientific meetings.

18 Q. Okay. I'm asking if you ever published that?

19 A. As I said, I don't write the -- the same conclusion --
20 two papers on the same conclusion. In other context where I
21 was discussing frequency of a profile in relatives I did
22 mention that in Karitiana -- in that in-bred population --
23 that individuals with strong inbreeding had the same profile.
24 I made that statement.

25 Q. When you made that statement did you also go on to
26 state, Therefore my Science article publication was, in fact,
27 incorrect?

28 A. Science article is not wrong.

1 Q. Okay.

2 A. Because that statement -- incorrectness of that
3 statement does not invalidate the entire article. That
4 statement, as I am saying now I have said many times, that
5 that statement for that database is incorrect.

6 Q. Okay. But when you mention in other articles and
7 presentations that, in fact, there are some closely related
8 individuals in the Karitiana who do match at several VNTR
9 loci, do you go on to explicitly state, Therefore my
10 statement in my Science article that there are no such
11 individuals is incorrect?

12 A. No. I have not stated that explicitly anywhere.

13 Q. Okay. Now, it is fair to say that as the first or
14 principal author of an article you are endorsing all of the
15 content of the document, correct?

16 A. At that time I did and still accept that statement. No
17 other statement has been proven wrong of that article after
18 eleven years of publication of that paper.

19 Q. Okay. Did you say that you wrote that sentence or
20 Kenneth Kidd?

21 A. I think that sentence was written by Kenneth Kidd.

22 Q. Did you ever ask him if he had checked the data to see
23 if his claim was correct?

24 A. Oh, at that time I asked him. Not in -- I mean, I
25 don't remember whether I demanded data particularly with
26 respect to that sentence. In general I asked him, yes.
27 After the -- it was found out that the -- there were some
28 duplicates I asked him to show that data and he, to date,

1 hasn't gotten time to give the data.

2 Q. Did he ever tell you one way or another whether he had
3 just assumed that or whether he checked the data?

4 A. Well, let me answer that. When I asked him -- let me
5 be -- to make our discussion short and simple, it was
6 Laurence Mueller who pointed out that there were a couple of
7 duplicates in the database.

8 Q. And that would be in a published article in
9 Accountability and Research?

10 A. Right. And Dr. Mueller got that data from court
11 discovery in a case in Ohio, Toledo. The database that was
12 submitted in the court, as the transcripts of Dr. Kidd will
13 demonstrate, that that was not yet unedited data, not yet
14 reviewed by all of the research collaborators. Nonetheless,
15 that demonstration that at several loci two pairs of
16 individuals did have matching profiles was reported by
17 Dr. Mueller.

18 Later on in -- in the scientific community we ask for
19 documentation of known relatedness of individuals except for
20 a -- except for ability of a general pedigree where we could
21 verify that one match reported by Dr. Mueller comes from two
22 full siblings of uncle/niece marriage we have no further
23 knowledge as to how the other match could have been obtained.

24 As of today we do not know, and Dr. Kidd's response was
25 since that database was not generated for forensic use, he
26 did not have time to investigate the complete details of the
27 individuals of that database.

28 Q. I guess my question, sir, is, When he makes the

1 statement that there are no individuals even in a database of
2 close siblings that there were no matches, that clearly
3 implies that he has looked, he has found none and is
4 reporting that.

5 Did he ever indicate to you whether he had in fact
6 looked at the data, found none and reported it or whether he
7 had instead just assumed or inferred there were none?

8 A. As the evidence that two duplicate matches were found,
9 clearly the statement is wrong. So I assume Dr. Kidd has --
10 before writing that he did not check it.

11 Q. Okay. And as principal author you are responsible for
12 making sure that the content of an article is accurate and
13 precise, correct?

14 A. Yes.

15 THE COURT: Well, you say you assume he did not check
16 it. What was your understanding or assumption at the time
17 you authored or co-authored this article?

18 THE WITNESS: My assumption was he did.

19 THE COURT: That he did?

20 THE WITNESS: That he did check.

21 THE COURT: Okay. And now you assume he must not have?

22 THE WITNESS: Correct.

23 Q. (By MR. LYNCH) Now, moving on. You also testified in
24 a case back in 1997, US versus Burke.

25 Do you remember testifying in that hearing?

26 A. Yes.

27 Q. Fair to say Dr. Mueller was a defense witness at that
28 hearing?

1 A. Yes.

2 Q. And I believe you had witnessed his testimony about the
3 results that he had presented at a conference that would
4 question the reliability of the product rule?

5 A. Yes.

6 Q. Okay. And you recall being asked about who sponsored
7 that conference when you were put on the stand?

8 A. Yes.

9 Q. And you recall stating, I know that it has been
10 organized by a public defender?

11 A. Yes.

12 MS. SCHUBERT: Can I object at this point, unless he
13 wants to provide me with the transcript so I can see the
14 context of the questions he is addressing from a prior court
15 proceeding.

16 THE COURT: Well, I think it should be provided to you
17 promptly, but I don't know that you have to have it before he
18 asks the question.

19 MR. LYNCH: Okay. I have them on the desk, and I will
20 probably get to them if there is any dispute by the witness
21 as to what was said. I will get to them in just a moment.

22 Q. (By MR. LYNCH) You stated that you did say, I know
23 that it is being organized by a public defender.

24 My question to you is, What did you base this fact on?

25 A. Well, my perception because the -- one of the things I
26 learned later on, one of the principal, um, speakers at that
27 conference was a public defender.

28 Q. Okay. So you assumed then that it was organized by a

1 public defender?

2 A. Yes. I assumed, yes.

3 Q. Okay. But your testimony was, I know that it was
4 organized by a public defender, correct?

5 A. That is exactly the point. I would like to say in
6 court, as we have all different accents, different ways of
7 speaking, what is written in the transcript is not
8 necessarily what I meant to say. Maybe the -- there were --
9 after repeated questioning my answer was yes, I know, but
10 that's -- that was rather my presumption rather than based on
11 some --

12 Q. I'm sorry.

13 A. -- facts and observations.

14 Q. Are you saying the transcript is wrong or are you just
15 saying that maybe you misspoke?

16 A. I misspoke.

17 Q. After repeated questioning you say --

18 THE COURT: How important is this about how he
19 understood and said a certain conference was put on somebody,
20 how important is that?

21 MR. LYNCH: There is -- in response to questions in
22 here he makes certain claims that are just plain inaccurate,
23 and the witness's willingness to make those claims on why and
24 when he makes those claims is supremely relevant.

25 THE COURT: I won't go with supremely. I guess I will
26 let you inquire, but I find it very difficult to find a
27 reference to who put on a conference to be earthshaking
28 importance or to suggest chicanery or a desire to deceive.

1 MR. LYNCH: I understand, your Honor.

2 Q. (By MR. LYNCH) I believe the question was, Are you
3 saying you are -- you said, I know it's been organized by a
4 public defender after repeated questioning on that topic --

5 MS. SCHUBERT: Well, I'm going to object to that.

6 THE COURT: I don't understand that question. I think
7 he told you he misspoke.

8 MR. LYNCH: My understanding was the witness's
9 testimony was that he misspoke and it was probably after
10 repeated questioning on the topic. I'm just trying to
11 clarify if that's what he's saying.

12 THE COURT: All right.

13 Q. (By MR. LYNCH) Is that what you are saying?

14 A. I don't know. I have to look at the -- I believe that
15 is about nine or ten years old. I have to look at the entire
16 testimony as to how many different questions were of a
17 similar kind.

18 Q. I will show you page 36 of the document I have yet to
19 mark and may not need to mark. Um, obviously there's some
20 time before we get to this subject, but would it be fair to
21 say that the subject was first broached on page 36 and the
22 first question was, Who organized it, is that how it goes?

23 A. Show me where you are reading from.

24 Q. I forget exactly where it is. Oh, there it is.

25 A. I think this speaks for itself. Are you familiar with
26 that conference, sir? Not directly, but I heard that -- I
27 heard of that conference. And who was sponsoring that
28 conference? I do not know whether I can answer that question

1 because the way you frame it. I do not know really who
2 sponsored it. I know that it is being organized by a public
3 defender.

4 So you are pulling out the last statement not referring
5 to what I said before, I do not know whether I can answer
6 that question because of the way you frame it. I do not know
7 really who sponsored it. I know that it is being organized
8 by a public defender. Clearly it is misspeaking. It
9 reflects, I assume --

10 Q. Okay. So you --

11 THE COURT: Is he correct in what it says?

12 MR. LYNCH: Yeah. That's a fair --

13 THE COURT: Doesn't that take a lot of steam out of
14 this whole issue?

15 MR. LYNCH: It does, your Honor, but there is a series
16 of questions on that testimony I tend to get into.

17 THE COURT: Well, that one is not a home run.

18 MR. LYNCH: I know. I know it is cumulative, your
19 Honor.

20 Q. (By MR. LYNCH) But fair to say they are asking who
21 sponsored the conference. You said, I don't know who
22 sponsored it but I know who organized it, correct?

23 A. Yes. That --

24 MS. SCHUBERT: I'm going to object.

25 THE WITNESS: That's what it states.

26 Q. (By MR. LYNCH) You were asked if the publication of a
27 paper from that conference or such a conference would be
28 considered peer reviewed and you stated the conference is

1 certainly, obviously, not peer reviewed because if it is
2 organized by somebody he or she can invite persons of his or
3 her choice?

4 A. Correct.

5 Q. Okay. What did you base this fact on?

6 A. This is the general -- for example, I'm going to
7 Germany this Friday to attend the International Conference of
8 Genetic Epidemiology. The person, Chris Amos, A-m-o-s, who
9 is organizing it, he is inviting the persons that he knows.

10 Q. Okay. But the point is you are saying it's certainly
11 not peer reviewed when, in fact, you don't really know who
12 sponsored or who organized the conference, correct?

13 A. The conference proceedings I believe was published by
14 then -- the conference proceedings are soon to be published.
15 The conference proceedings are normally not peer reviewed in
16 terms of what we know peer review is.

17 THE COURT: Didn't we have this discussion earlier when
18 you were emphasizing that a conference's product is not
19 technically peer reviewed?

20 MR. LYNCH: I don't particularly recall, your Honor.

21 THE COURT: Well, I recall.

22 MR. LYNCH: Okay.

23 THE COURT: That was your theme, and it struck me at
24 the time that conferences probably aren't peer reviewed.
25 They are a report of a conference. What do you do, submit a
26 conference report to a bunch of people and see if they will
27 allow it to be printed? It makes no sense to me.

28 MR. LYNCH: I will move on, your Honor.

1 THE COURT: You are taking a flip side of the argument
2 at this point.

3 MR. LYNCH: I have been known to do that, your Honor.
4 I apologize.

5 Q. (By MR. LYNCH) You've done lots of work for the
6 National Institute of Justice, correct --

7 A. Yes. I have done a lot of work with funding from
8 Department of Justice.

9 Q. -- fair to say?

10 A. And in each of these publications there is, in that
11 acknowledgement, a statement that the results of my study are
12 in no way an endorsement of the Institute or the --

13 THE COURT: Results of your --

14 THE WITNESS: My research is not an endorsement of the
15 institute or the funding agency.

16 Q. (By MR. LYNCH) Okay. You have done a lot of work for
17 the institute which is a prosecution or a law enforcement
18 agency, correct?

19 A. I won't say for -- I did that work with funding from
20 National Institute of Justice, yes.

21 Q. You have also worked closely with the FBI, correct?

22 A. Yes. I collaborated with -- I have research
23 collaboration with the FBI academy scientists.

24 Q. And Dr. Budowle's name has been used a lot of times in
25 this proceeding.

26 What is his position with the FBI?

27 A. I do not know his exact position but in effect he is in
28 charge of the research and development section of the

1 forensic science -- DNA forensic science in FBI academy.

2 Q. Okay. Fair to say you have gotten thousands of dollars
3 in grant money from the National Institute of Justice since
4 1992?

5 A. Our university in Texas did, yes.

6 Q. Okay. Well, there was no grant money before, um, the
7 first grant in 1990 through 1992, correct, from the National
8 Institute of Justice?

9 A. I don't understand.

10 Q. Before the period of 1990 to 1992, when you first --
11 well, would it be fair to say that your first grant from the
12 National Institute of Justice came in the time period of 1990
13 to 1992?

14 A. Yes.

15 Q. Which is when the DNA issues for court admissibility
16 really started to emerge, correct?

17 A. Yes.

18 Q. And a lot of grant money was related to establishing
19 what was necessary to admit evidence in court, correct?

20 A. Yes.

21 Q. That first grant in 1990 to 1992 was for almost
22 \$300,000, correct?

23 A. Yes.

24 Q. Had nothing to do with the health center or your
25 teaching, um, directly at the -- I forget where it was,
26 university in Texas?

27 A. It was very relative because what I was -- I had been
28 doing since 1974 was in the subject -- were intimately

1 related to these issues, such as effect of genetic -- effect
2 of population mixture on genetic variation, effect of
3 populations of subdivisions on frequency of genes or genetic
4 profiles, relevance of population mixture for disease gene
5 association studies. So all of the principles were
6 intimately related with the research that I had been doing
7 since 1969.

8 Q. Okay. But the period 1969 to 1990, before you started
9 work on the grant, you had not been working on forensic
10 applications of DNA testing?

11 A. Unfortunately -- unfortunately for you probably is yes.
12 My first paper, which is still a citation classic, was
13 published in 1974.

14 A. Regarding genetic variation and their use in parentage
15 testing and individual identification?

16 Q. My question was regarding --

17 THE COURT: Let's see. This is regarding genetic
18 variation and their use in parentage testing?

19 THE WITNESS: Yes. And human identification.

20 THE COURT: All right.

21 Q. (By MR. LYNCH) My question though was with regards to
22 DNA testing as we understand the term in forensic
23 applications, prior to 1990 you were not doing research or
24 teaching that subject in Texas university?

25 A. Yes, I was. If you are talking about DNA testing my
26 first paper goes back to 1986.

27 Q. About DNA forensic testing?

28 A. Again, yes.

1 Q. Now, that first grant was called for DNA and forensic
2 applications, a very general title, correct?

3 A. Yes.

4 Q. Your next grant you got was for over 100,000, again,
5 for forensic applications of DNA?

6 A. Correct.

7 Q. You got another grant for 150,000, almost, for
8 validation of the PCR typing in forensics?

9 A. Correct.

10 Q. Uh-huh.

11 A. And just so that these testimony does not get
12 misinterpreted or taken out of the context, in future all of
13 this grant when I'm answering yes and your question is you,
14 I'm referring to my institute. Grant proposals are written
15 by investigators, money is obtained by the institute. Not
16 even a single penny of those grants was paid to me.

17 Q. But as the requester of the grant you get some control
18 over how that money is spent during the research, correct?

19 A. Correct. Such as reagents used in the experiments,
20 computers bought to conduct the research, graduates stipends
21 paid, seminar speakers invited into the department, seminars
22 and so on.

23 Q. Okay. And you get some prestige within the university
24 and, in fact, worldwide from getting your name associated
25 with the research that these funds pay for?

26 A. Correct. Because our philosophy and the way your tax
27 dollars is paid back is by paying us, the professors, is to
28 publish our parish.

1 THE COURT: Parish?

2 THE WITNESS: Correct.

3 THE COURT: Parish; someone dies, they parish.

4 THE WITNESS: So university professors can only
5 document that they are working by publishing. The answer is
6 yes.

7 MR. LYNCH: Okay.

8 Q. (By MR. LYNCH) And by publishing you get notoriety
9 which boosts your career both directly in terms of promotion
10 and indirectly in terms of speaking engagements and other
11 things that you can charge money for and earn money from,
12 correct?

13 A. Correct. By the way, we do not charge money for
14 attending conferences. They only pay us economy class, air
15 fair, \$34 a day per diem for food.

16 Q. Okay. I just want to mention another couple of grants.
17 One for 50,000 for the validation of the 13 C.O.D.I.S. core
18 loci?

19 A. Correct.

20 Q. And you got another grant for close to 100,000 for the
21 same thing?

22 A. Correct.

23 Q. Okay. And fair to say you have always published in
24 support of the methodology and interpretation of DNA
25 evidence?

26 A. Well, many of this --

27 THE COURT: That is a very vague concept.

28 MR. LYNCH: Well, let me ask the question again.

1 THE COURT: Always in support of the methodology --

2 Q. (By MR. LYNCH) Have any of your publications been
3 critical of the use of DNA identification in forensics?

4 A. In some -- yes. Some are.

5 Q. In what way?

6 A. For example, I have written papers where I have said
7 that exclusion is not necessarily a definitive answer of DNA
8 testing.

9 Q. Well, have you ever said that DNA testing is inadequate
10 or should not be admitted in courts because it is unreliable?

11 A. No. I have not made that statement because that
12 statement is not scientifically supported.

13 Q. Right now you have a \$500,000 grant application pending
14 with the National Institute of Justice, correct?

15 A. Yes. We -- we have the recent letter saying NIJ is not
16 going to fund that proposal.

17 Q. Okay. Why were you seeking the funding, it is for
18 forensic DNA, correct?

19 A. Yes.

20 Q. To research what issue of forensic DNA?

21 A. Well, what 9-11 has taught us is there are needs for
22 answering more complicated questions such as when multiple
23 individuals claim that the evidence sample might be from
24 their relative. The current C.O.D.I.S. short tandem repeat
25 loci might not be enough to answer those questions so we
26 submitted a proposal to validate several other alternative
27 loci.

28 Part of our application was also to have a point and

1 click software that can be used by non technical -- by non
2 technical persons in order to answer some of the relevant
3 questions asked in DNA forensics. Part of the proposed work
4 was also to develop new technologies of miniaturizing the DNA
5 testing so that even investigators can use DNA typing
6 protocols from samples collected from the field.

7 THE COURT: Let me ask one question.

8 MR. LYNCH: Okay.

9 THE COURT: Um, several other alternative loci, part of
10 your application was also to have some kind of software.

11 THE WITNESS: Yes. Point and click.

12 THE COURT: Point and click?

13 THE WITNESS: Yes.

14 THE COURT: What's that mean?

15 THE WITNESS: Well, you ask the computer a question in
16 plain English and it produces a screen so that you can answer
17 each question and then computer gives you the answer.

18 THE COURT: Click means you just push the --

19 THE WITNESS: Push the button.

20 THE COURT: And it comes out?

21 THE WITNESS: Right.

22 THE COURT: Okay. I'm exposing my unfamiliarity with
23 the computerized world.

24 Q. (By MR. LYNCH) Just with respect to one part of that
25 grant application, you said you were seeking to research the
26 feasibility of additional loci. I want to try and
27 encapsulate, was that to the issue of multiple relatives?

28 A. Yes. When multiple individuals claim that it is their

1 relative.

2 Q. Okay. Now, you have got an award listed down from the
3 FBI for research during the decade of DNA; is that correct?

4 A. Correct.

5 Q. And fair to say that decade was the decade in which the
6 major legal obstacles to the prosecution admitting DNA
7 evidence were argued?

8 A. Yes.

9 Q. And that your work and testimony was instrumental in
10 getting favorable court rulings for the prosecution?

11 A. I do not know how to answer that question because I'm
12 not a national repository of all of the cases in the United
13 States. Obviously I did not testify in all of them, but I
14 know that by 1998 what has been declared as the -- as the
15 protocol generally accepted is best fundamentally on my
16 research.

17 For example, in 1992 we were the pioneer in the old
18 world to suggest that short tandem repeat loci may be an
19 efficient way of DNA typing. That became a protocol. Then I
20 was the first to suggest how to add degree of
21 conservativeness in this -- in the estimate of random match
22 probability. That became a generally accepted protocol. In
23 1997 or 1998 I was the one who proposed that in order to
24 increase or decrease the probativeness of estimates of random
25 match probability, this is how you can guard against
26 offerings of very uncommon alleles, objectively this became a
27 general standard.

28 So although there was no specific reasoning in the

1 citation of my award from FBI I believe these are the
2 rationale that I was chosen as an awardee.

3 Q. Fair to say that that decade they referenced though,
4 your testimony was crucial or key in overcoming defense
5 objections to the admission of DNA evidence?

6 A. I cannot answer that question.

7 Q. Fair enough.

8 Um, do you have any awards from the defense bar?

9 A. No. But I have about half a dozen defense cases I
10 reviewed and gave them advice.

11 Q. Okay. Do you have any awards from a neutral legal
12 body, ie, not a prosecution or defense oriented body?

13 A. Define what is neutral.

14 Q. Well, I tried to.

15 Are you aware of any awards you may have that could
16 possibly qualify as coming from a neutral body?

17 A. Well, I have several awards from organizations or
18 institutions that are neither prosecution nor defense. For
19 example, the dean of studies of university of Texas School of
20 Public Health, our graduate school, in my opinion they can be
21 called neutral. During my entire tenure I received numerous
22 awards from them.

23 The North American Bengali Organization which is, I
24 believe, a cultural association. I don't believe it
25 associates itself with prosecution or defense bar, I don't
26 think. They also awarded me --

27 Q. I guess maybe I omitted a word from my question. I was
28 asking for legal bodies, bodies in the legal community, other

1 than prosecutors or defense bar that would -- that have given
2 you awards. By awards I mean congratulatory announcements,
3 that they are awarding or honoring you.

4 A. That is why I asked you the question, What do you mean
5 by neutral.

6 International Institute of Legal Medicine in Austria.

7 Q. Okay.

8 A. In your opinion is that a neutral body?

9 They are -- they send me a congratulatory letter. The
10 Institute of Legal Medicine in Bogota, Columbia, where I was
11 the keynote speaker of the last meeting awarded me.

12 Q. Fair to say you have been a member of the DNA Advisory
13 Board since 1995?

14 A. Yes. During it's entire tenure. The DNA Advisory
15 Board no longer exists. It finished its charter in 2000.
16 During all of the five years I was a member, yes.

17 Q. Okay. And that was set up by the FBI, correct?

18 A. That was set up by FBI director, yes.

19 Q. It was chaired by the FBI?

20 A. No.

21 Q. Who was the chairman?

22 A. First chairman was Joshua Lederberg. At that time he
23 was the president of Rockefeller University Nobel laureate
24 scientist and after he resigned, because of a possible
25 conflict because he was also on the board of directors of a
26 private organization whose work related to the DNA
27 technology, then the next, um, chairperson was Arthur
28 Eisenberg, an associate professor in Texas.

1 Q. Maybe I misunderstood my own notes.

2 Is it fair to say that the -- the board members of the

3 DNA Advisory Board are appointed by the chairman of the FBI?

4 A. At the recommendation of, um, organizations of

5 different, um, expertise -- areas of expertise.

6 Q. Would you say many of the board members on the DNA

7 Advisory Board have been affiliated in one way or another

8 with the FBI?

9 A. I have never been affiliated with FBI.

10 Q. Not you. I'm saying many of the board members --

11 MS. SCHUBERT: Well, I will object to that as vague.

12 Affiliate, what does that mean?

13 Q. (By MR. LYNCH) Well, there are some people on the --

14 THE COURT: That is pretty vague.

15 Q. (By MR. LYNCH) Are there some people on the board that

16 were or have been working for the FBI?

17 A. Yes. There were some members.

18 Q. And you have been a consultant with the FBI academy

19 since 1989, correct?

20 A. Correct.

21 Q. And you still are?

22 A. Yes. Unpaid consultant I might add.

23 Q. Now, we talked about the decade of DNA. Um, fair to

24 say there was a point in time where the courts were wrestling

25 whether the product rule was generally accepted, correct?

26 A. I do not know how to answer your question because the

27 word wrestling bothers me. Yes, there were court

28 discussions.

1 Q. Your opinion has always been that there is no problem
2 with substructuring in the human population; fair to say?

3 MS. SCHUBERT: I will object to relevance.

4 MR. LYNCH: Well, this is -- the whole line of
5 questioning that the District Attorney was allowed to go into
6 and took some considerable time. I'm going over his --
7 Dr. Mueller's various opinions and what period in time they
8 became unaccepted by the community and whether there was
9 disagreement in where he stood on those positions.

10 THE COURT: I will permit it.

11 THE WITNESS: I have never made that statement because
12 from the very beginning I -- my suggested statistical
13 protocol took care of reasonable population substructuring
14 effects.

15 Q. (BY MR. LYNCH) Okay. But you have testified before
16 there was no population substructure in the United States?

17 A. I have never stated that way.

18 Q. You have stated that the substructure that exists was
19 not forensically significant.

20 Have you testified to that?

21 A. Correct. After the way you -- you look at the
22 statistics.

23 Q. Okay. Even though there was significant members of the
24 population genetics community who were saying that the
25 substructure was significant, correct?

26 A. They were creating a straw man -- straw man, a
27 hypothetical man.

28 Q. Okay.

1 A. The reason is these kinds of statements are often
2 quoted without the context if you look at the product rule.
3 That is why I think in my direct several times I tried to
4 correct the Prosecutor saying, I called that modified product
5 rule. Nobody right from the beginning has ever used straight
6 product rule, what I have been calling in court as product
7 rule, and had been argued happened. Nobody used that.
8 Everybody used modified product rule.

9 From the very beginning, because of my studies on
10 population substructure go back to pre-DNA era, I argued that
11 the -- the empirical data on the extent of effects of
12 population substructure is such that once you use the
13 protocol of modified product rule everything is accounted
14 for.

15 So if you pull out statements from my previous
16 testimonies that I have said there is no effect of product
17 rule, it -- I was trying to say that, in fact, on the
18 modified product rule I never stated that there is no
19 population substructure effect because I don't think there is
20 any person in the world, except Newton Morton, who has been
21 working on population substructure effect as long as I am
22 working on. I have always showed that the definition of
23 geographic populations are based on gene frequency variation
24 across populations and therefore such and such thing needs to
25 be done. I never stated that there is no population
26 substructure.

27 What I have stated in the context of DNA forensic
28 calculations is the modified product rule as practiced by the

1 community takes care of existing labels of substructure
2 effect.

3 Q. Okay. And you testified to that effect even when
4 significant members of the scientific community were saying
5 there is not enough data for us to conclude that the
6 substructuring is insignificant in a forensic setting,
7 correct?

8 THE COURT: Does he ever say the substructure is
9 insignificant?

10 MR. LYNCH: I believe he said forensically
11 insignificant in testimony today. I believe his long answer
12 to the prior question was essentially such that
13 substructuring wasn't significant in the forensic setting
14 because of the way the product rule has been modified, um, to
15 account for that.

16 Does that make sense, your Honor?

17 THE COURT: That makes sense. That makes sense, but
18 I'm not sure your question does.

19 MR. LYNCH: It may not. Let me re-ask it.

20 THE COURT: Yes. Your question is incomplete and so
21 you better re-ask it.

22 Q. (By MR. LYNCH) Sir, you were testifying that there was
23 no significant effect of substructuring when in fact there
24 was significant members of the scientific community saying
25 there is not yet sufficient data to draw that conclusion.

26 THE COURT: No. See, the problem with your question,
27 in my view --

28 MR. LYNCH: Okay.

1 THE COURT: -- you were testifying that there was no
2 significant effect of substructuring. I don't know that he
3 has testified to that fact. He has said that substructuring
4 does not have an effect or a significant effect with
5 modifications that are put into the rule. But your question
6 taken literally would suggest that from day one without
7 modification he is saying substructuring is nothing.

8 MR. LYNCH: I understand.

9 THE COURT: Okay. Well, it distorts what he has said
10 in my view.

11 Q. (By MR. LYNCH) Sir, when -- I'm going to get into a
12 very long complex question here.

13 Essentially, when you have testified in the past that
14 the effects of substructure are not significant given the
15 modifications that, um, were in place in the product rule,
16 there were other scientists, significant distinguished
17 scientists who were saying we disagree, we think there is not
18 enough information for you to draw that conclusion, correct?

19 A. Yes. There had been other scientists who said that in
20 court.

21 Q. Okay.

22 A. But, again, what they were trying to do is confuse the
23 Court as if we use the straight product rule.

24 Q. Well, let me ask you this: The Lewontin/Hartl
25 article --

26 MR. NELSON: MM.

27 Q. (By MR. LYNCH) I'm sorry. As in Mother. That article
28 was essentially saying, We don't have enough information yet

1 to draw the conclusion that even with the modifications to
2 the product rule that there is insignificant substructure?
3 A. Yes. They said that but that's -- that is the -- that
4 was the need of the rejoinder. In the same issue if you look
5 at Lewontin and Hartl's article you will see that the
6 numerical example that they are drawing is from pre-DNA era;
7 namely, MN blood groups.

8 So on the other hand, me and Dr. Kidd, in my article,
9 we were mentioning about the effect of substructuring and the
10 2P rule, two times P, 2P rule, is the modified product rule.
11 So the -- the scientists who were saying that there is no
12 data, they simply did not have any knowledge about what the
13 current science was.

14 Q. Okay. You're criticizing them but my question is, They
15 were -- their opinion essentially was there is not enough
16 data yet to draw the conclusion that you were drawing at that
17 time?

18 A. Yes.

19 Q. Okay.

20 THE COURT: You believe the conclusion you were drawing
21 at that time is still valid?

22 THE WITNESS: Yes. It is even proven to be more valid.

23 Q. (By MR. LYNCH) You testified in the Venegas case,
24 correct?

25 A. Yes.

26 Q. One of the core issues was whether the FBI's binning
27 method was scientifically acceptable as they were doing it,
28 correct.

1 MS. SCHUBERT: I'm going to object as to relevance on
2 RFLP versus STRs.

3 MR. LYNCH: Your Honor, this is exactly what the
4 District Attorney did with Laurence Mueller that I objected
5 to and the Court let in. I'm attempting to show what the
6 Doctor's opinion is and what the Court of Appeal endorsed and
7 the Supreme Court reversed. It is exactly what the
8 Prosecution did.

9 THE COURT: That is at least a very plausible position.
10 I'll permit it.

11 Q. (By MR. LYNCH) I don't recall if I asked the question
12 about Venegas.

13 The core issue -- one of the core issues was whether
14 the FBI binning method was an acceptable scientific
15 technique?

16 A. Yes. That was the issue.

17 Q. And you testified that the FBI binning method was
18 scientifically acceptable?

19 A. Yes.

20 Q. And you even testified that the way that they were
21 using it it was, in fact, excessively or overly conservative?

22 A. Right, because their match criterion had two parts.
23 One part, dependent on the binning. The other was a visual
24 matching. My answer of conservativeness did include both
25 parts, yes.

26 Q. Okay. And Dr. Mueller testified contrary to that, that
27 the technique was not scientifically acceptable, correct?

28 A. Yes. When he looked at only one item, an eye and said,

1 He is one-eyed. When he looked at one eye and said, The man
2 is one-eyed.

3 Q. Well, he testified that the whole method under their
4 protocols was not scientifically acceptable, the whole
5 binning method was not acceptable?

6 A. All -- what I read in his transcript, he was only
7 looking at the quantitateness match criterion, not the
8 visible match criterion.

9 Q. And as far as the quantitative match criterion, he
10 testified that it was not scientifically acceptable because
11 it unfairly caused the match probability to be weighted
12 against the defendant?

13 A. That was his statement unsupported by any data.

14 Q. Well, the Supreme Court agreed with Dr. Mueller that
15 the binning method was not scientifically acceptable and that
16 it did weigh the evidence unfairly against the defendant?

17 A. I have to look at the Supreme Court ruling before I
18 make any statement.

19 Q. Okay.

20 A. Because I do not know -- have it with me.

21 THE COURT: Is the binning method used today?

22 THE WITNESS: No.

23 Q. (BY MR. LYNCH) It relates only to RFLP methodology,
24 correct, Doctor?

25 A. The concept of binning does not arise for STR loci.

26 Q. Putting part of the opinion on the overhead I will read
27 from that. We conclude, comma, however, comma, that the
28 trial court erred in ruling that the FBI's failure to follow

1 correct scientific procedures by using the unduly narrow
2 floating bins was a matter affecting only the weight of
3 evidence for the jury's consideration.

4 It goes on to say, The court of appeal should have
5 recognized the trial court's error in that regard, and held
6 instead that the FBI's use of improperly sized floating bins
7 was a failure to follow correct scientific procedures within
8 the meaning of Kelly's third prong.

9 I assume you have read the case at some point in time,
10 Doctor?

11 A. I have not read this. In fact, I'm confused.

12 Q. If the Doctor hasn't read the case and --

13 MS. SCHUBERT: I will object to that. If he is going
14 to cross-examine him on the contents of the document, he
15 should let him continue to review the document.

16 MR. LYNCH: If the Doctor has anything to say about it
17 that is fine, but my -- I'm starting to realize if he hasn't
18 read the case he is not going to be able to exactly say what
19 he held, and I would leave that for the Court to decide.
20 Seeming this is a legal case the Court can consider in
21 addressing these issues.

22 THE COURT: Well, I'm not sure just what the issue
23 before me is at this point.

24 What do the People suggest?

25 MR. LYNCH: I will tell you why I'm offering it, if
26 that would help.

27 THE COURT: It seems we were having a debate here, I'm
28 not sure what the crux of it is.

1 MS. SCHUBERT: Well, he is seeking to cross-examine him
2 on the contents of the opinion when he is not allowing him to
3 review the contents of the opinion to give it context. He
4 wants to read in a snippet of the opinion without allowing
5 Dr. Chakraborty to review the entirety of the opinion.

6 THE COURT: Well, first of all --

7 MR. LYNCH: Once I --

8 THE COURT: -- unless -- he is a very bright man, he
9 probably reads a lot faster than I do, but Supreme Court
10 opinions are not digested in ten minutes commonly. So I
11 think that if somebody wants to study it and comment on it at
12 some point they will be given time to do that, otherwise the
13 Court is capable of evaluating in argument Counsel's views on
14 what this case means.

15 What is the citation on that particular case?

16 MR. LYNCH: Venegas, your Honor, is --

17 THE COURT: Oh, that is Venegas? Okay. I can find
18 Venegas. I had just forgotten the name. There it is. Okay.

19 Q. (By MR. LYNCH) Do you still have the opinion, sir,
20 that the FBI's technique of using floating bins in that
21 particular procedure was scientifically acceptable?

22 A. The reason that I'm confused is I don't think FBI had a
23 floating bin concept. They had what is called fixed bin
24 concept. So that's what confuses me.

25 Q. What was being discussed in that context you say you
26 don't have any recollection that one of the protocols
27 involved a floating bin?

28 A. Yes. One of the protocols was floating bin.

1 Q. Okay.

2 A. But FBI's general practice was to use the fixed bin
3 approach.

4 Q. Okay.

5 A. So I have to go back and look at the context in which
6 the floating bin was discussed in that court.

7 Q. Have you had any change of mind as to whether the
8 protocols used by the FBI are acceptable?

9 A. Yes. At that time I did -- did a considerable amount
10 of research, and the general conclusion of my research was
11 the FBI's fixed bin approach or the floating bin approach as
12 opposed -- as being used by others yields conservative
13 estimate, particularly when you infer a match based on a
14 two-stage procedure; visual match and quantitative match.

15 Q. Okay. I guess my question is -- you said you believed
16 that the FBI's methods at the time was scientifically
17 acceptable.

18 My question is, Do you still believe that?

19 A. Yes, I still believe that.

20 Q. Were you aware that the Supreme Court had disagreed
21 with you on that point?

22 A. That's what I have to look at. I have to look at the
23 Supreme Court ruling about the specificity of that case.

24 Q. Okay. I understand.

25 Now, besides, um, the \$3,000 a day that you get paid --
26 excuse me, that the university gets paid for your testimony,
27 fair to say you get paid for other work that you do in this
28 field, that you get paid directly yourself for other work?

- 1 A. I don't understand your question. Yes, I am paid a
2 salary by the university for my research and teaching.
- 3 Q. Okay. You also get money from doing consulting work or
4 scientific advising for private individuals, correct?
- 5 A. Uh, not -- private individuals?
- 6 Q. Yes.
- 7 A. I do get consultancy money for reviewing grants as is
8 standard. As a review board member I get consultancy money
9 to act as a advisor, external advisor of some international
10 research projects.
- 11 Q. Being on the boards or presidents or vice presidents of
12 professional societies, do you get paid?
- 13 A. I wish I did. I wouldn't have been so worried about
14 paying my bills then.
- 15 Q. What about organizing or co-organizing symposiums?
- 16 A. No. We do not generally get money.
- 17 Q. What about for being on the DNA Advisory Board?
- 18 A. No. That's a non paid --
- 19 Q. No compensation at all?
- 20 A. No.
- 21 Q. What about speeches and presentations?
- 22 A. Uh, no.
- 23 Q. Now, your money goes to the university, correct?
- 24 A. Yes.
- 25 Q. Okay. And the money that you get from testifying is
26 used by the university to fund your research efforts,
27 correct?
- 28 A. Uh, not -- yes, in a sense. My graduate students get

1 paid from that fund. The seminar speakers whose talks -- who
2 lectures or talks are part of some specialized courses. In
3 that sense my research and training, um, gets help from these
4 funds.

5 Q. And fair to say just like the National Institute of
6 Justice grants you get to buy lab equipment, computers,
7 reagents from those funds?

8 A. Correct.

9 Q. Okay. And the more funding you get the more research
10 you can do; fair to say?

11 A. Correct.

12 Q. And the more research you or rather your students can
13 do, um, the more you can publish, correct?

14 A. Correct.

15 Q. And publication is the key to success in the academic
16 world, correct?

17 A. Correct.

18 Q. I don't think I ever mentioned it but -- you know, I
19 think I'm done. Thank you.

20 THE COURT: You think you are done?

21 MR. LYNCH: I think so, your Honor. We are trying to
22 get this witness on a plane tonight.

23 THE COURT: Was that the hope, to have our witness
24 concluded?

25 We will do our best, sir.

26 MS. SCHUBERT: I want to ask Dr. Chakraborty to
27 briefly look at the Venegas decision and see if it refreshes
28 his memory so we can put things into context.

1 THE COURT: Do you think it would help if we take our
2 break at this point?

3 MS. SCHUBERT: Yes, Judge, if that would be --

4 THE COURT: It's about 18 minutes before 3:00. We will
5 take our usual 15 minutes.

6 MS. SCHUBERT: Thank you.

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2 (Proceedings resumed after reporter switch
3 and an afternoon break.)

4 ---o0o---

5 THE COURT: Okay. The record will show all parties have
6 returned.

7 I have perused Vanegas, but as noted, it's a long case.
8 Okay.

9 MS. SCHUBERT: On that note, let me just ask a couple
10 questions about the Vanegas decision.

11 Q Dr. Chakraborty, with respect to that decision, was that
12 a decision that also the ceiling principle was utilized in that
13 case?

14 A Yes.

15 Q Would you agree that since that time frame of when that
16 testimony took place that the ceiling principle has been
17 rejected for use in court proceedings?

18 A Yes.

19 Q And would you agree that even before NRC-2 came out that
20 you yourself as well as other population geneticists were
21 critical of using the ceiling principle?

22 A Yes.

23 Q And is it fair to say that one of the primary reasons was
24 that it was an arbitrary calculation and not based on true
25 assessments of allele frequencies?

26 A Yes.

27 Q Okay. With respect to NRC-2 that did come out in '96,
28 did they in fact -- NRC-2 committee -- cite some of your

1 research in making the finding that the ceiling principle was
2 not a valid scientific statistical interpretation?

3 A Correct.

4 Q I'm going to show you page 157. Are there some -- as far
5 as you know, are there some individuals in the scientific
6 community that still advocate the ceiling principle even though
7 it's been found to be not generally accepted?

8 A I do not know how to answer that question because I've
9 seen the history of shifting opinions. Some of them probably
10 still do.

11 Q Okay. Now I'm going to show you here, this is page 157
12 of NRC-2. Just the last paragraph that's highlighted in yellow
13 here which says the ceiling principle has been widely
14 discussed, usually critically, cites your article, and Kidd,
15 Cohen, Morton, Evett, Kaye, Lempert, Weir, Balding, and
16 Nichols -- a number of other articles, Devlin, Riche, Roeder,
17 Landers, Budowle as well as TWGDAM; is that a fair assessment
18 that there have been criticisms of using the ceiling principle?

19 A Yes.

20 Q And the various reasons for criticisms are listed here,
21 one of which is the fact that it is an arbitrary assignment of
22 a statistical calculation?

23 A Correct.

24 Q And that it does not make use of the large amount of
25 allele frequency data that's available from different groups
26 and subgroups?

27 A Correct.

28 MR. LYNCH: Your Honor, objection. Could I ask the

1 district attorney to state the relevance or theory at this
2 point.

3 MS. SCHUBERT: Well, he's criticized him and
4 cross-examined on whether he advocated anything prior to NRC
5 coming out. And in fact, what he advocates is exactly what
6 NRC-2 ultimately made the decision on.

7 THE COURT: I'll permit it.

8 Q (By MS. SCHUBERT) Is it fair to say that prior to NRC-2
9 you held the position that the ceiling principle was not a
10 scientifically valid technique?

11 A Correct.

12 Q And in fact, NRC-2 ultimately made the decision that they
13 agreed based upon your research as well as a number of other
14 individuals' research?

15 A Correct.

16 Q Now with respect to the Vanegas decision, you had an
17 opportunity the review that briefly?

18 A Yes.

19 Q And in that particular decision was the modified ceiling
20 principle one of the subject matters in that decision?

21 A Yes.

22 Q And in that decision did you specifically read in there
23 that you had in fact testified that even though substructuring
24 does exist, it does not have a practical effect on the
25 reliability of the statistics?

26 A Yes, I did.

27 Q Now in terms of the product rule and Mr. Lynch's
28 questions about substructuring, you mentioned that you were one

1 of the first individuals to advocate the use of the modified
2 product rule, correct?

3 A Yes.

4 Q There is also a thing called the unmodified product rule?

5 A Correct.

6 Q Would you agree that the modified product rule is what is
7 utilized by forensic laboratories currently?

8 A Yes.

9 Q Would you agree that that statistic is a conservative
10 estimate of providing the random match probability?

11 A Yes.

12 Q Would you agree that the NRC-2 found or made the
13 determination that the modified product rule takes into
14 consideration the possibility of substructures?

15 A Yes.

16 Q Just for clarification, I'm going to show you page 104
17 here. And first of all, does NRC-2 cite your work as well as
18 several others' work for making the finding that the procedures
19 taken -- take deviation from Hardy-Weinberg into account?

20 A Yes, it does.

21 THE COURT: It's difficult when you flash a page up there
22 to get any benefit off of it if you don't tell us what part.

23 MS. SCHUBERT: Okay.

24 THE COURT: Because it has a lot of underlining. It's
25 difficult.

26 MS. SCHUBERT: Sorry.

27 Q Just for purposes of this particular page, would you
28 agree NRC-2 says to restate our approach is not to assume

1 Hardy-Weinberg proportions but to use procedures that take
2 deviations from Hardy-Weinberg into account. To do that we
3 return to discussions of population structures as measured by
4 theta, correct?

5 A Yes.

6 Q This is page 104. Now the article that you were shown by
7 Mr. Lynch between yourself and Ken Kidd and the other article
8 by Lewontin, L-E-W-O-N-T-I-N, and Hartl, H-A-R-T-L, fair to say
9 that these articles were written I guess 12 years ago about the
10 concept of the possibility of substructure dealing with the
11 RFLP technology?

12 A Yes.

13 Q Okay. Since this time in 1991, is it fair to say that
14 this quote unquote concern has been put to rest with respect to
15 the use of the modified product rule?

16 A Yes. In view of the general use of the modified product
17 rule and in view of the fact that today there exists enormous
18 amount of data, that discussion of whether or not the product
19 rule kind of predictions are in question, that whole issue
20 disappeared.

21 Q Okay. And what about with respect to the particular
22 authors Lewontin and Hartl?

23 A I do not know of their current position. Because I have
24 not asked that. And -- but Dr. Hartl in his textbooks, he uses
25 the product rule.

26 Q Okay.

27 A But specifically I have not asked them. And my
28 understanding is this person said that they are not interested

1 in DNA forensic or not aware of the current DNA forensic
2 issues.

3 Q Okay.

4 A But I have not asked them specifically.

5 Q Okay. Now in terms of these particular articles, and I
6 think Mr. Lynch asked you about specifically one of the lines
7 in there about the Karitiana tribe, correct, that there was an
8 incorrect statement in the article written by yourself and
9 Dr. Kidd?

10 A Yes.

11 Q Okay. With respect to the Karitiana tribe, fair to say
12 that that particular tribe does not exist in the United States?

13 A As far as I know I have not seen a Karitiana individual
14 in my life. As far as I know there's probably one person who
15 stated that he or she has seen an individual of Karitiana
16 origin somewhere on the East Coast. But in general Karitiana
17 is not a relevant population for U.S.

18 Q Okay. And in fact, that particular statement you just
19 had, you recall on page 109 of the NRC-2 report when there's a
20 discussion of the Karitiana, and I'm going to cite this,
21 another example that has been mentioned as evidence of a
22 multi-locus match is a highly inbred group, the Karitiana in
23 the Amazon. See Kidd, et al for discussion of the lack of
24 relevance of this example on populations in the United States;
25 is that a fair statement?

26 A Yeah, I agree with that. Yes.

27 MS. SCHUBERT: For the record, to make that clear, that
28 was in the foot note of page 109.

1 THE COURT: Of NRC-2?

2 MS. SCHUBERT: Yes.

3 Q I'm going to show you here, Dr. Chakraborty, People's
4 Exhibit 35 and ask you whether or not you agree with -- we
5 talked a lot about two questions from cold hit cases. These
6 two particular questions, one, what is the chance of finding a
7 coincidental match in the felon database. Two, what is chance
8 of finding an unrelated person in the entire human population
9 that also matches the evidence. Would you agree that those are
10 two questions that could be answered?

11 A Yes.

12 Q All of the articles that talked about that have been
13 cited here -- Balding and Donnelly, Evett and Weir, Morton's
14 article -- fair to say all of those articles address the first
15 question?

16 A Yes.

17 Q Okay. Would you agree that the second question, question
18 number two in this exhibit, is appropriately answered by the
19 random match probability?

20 A Correct. Yes.

21 Q Would you agree that with respect to question number two
22 it is generally accepted to use the random match probability to
23 answer that question?

24 A Yes.

25 Q And in fact, would you agree that -- I think you said
26 this earlier this morning -- that when talking about
27 specifically cold hit cases that all laboratories have provided
28 a random match probability on cold hit cases?

1 A Yes.

2 Q Okay. And I think --

3 MR. LYNCH: Objection. I believe that misstates the
4 testimony.

5 MS. SCHUBERT: That's what I'm asking him.

6 THE COURT: You may ask your question.

7 Q (By MS. SCHUBERT) In your testimony this morning, my
8 question is, is it true that in cold hit cases to your
9 knowledge all laboratories do in fact provide the random match
10 probability?

11 A Yes. Some do report additional things.

12 Q Okay. But setting aside the additional things, is it
13 your testimony that all of them provide the random match?

14 A Yes.

15 Q What other additional things may a laboratory provide in
16 addition to the random match?

17 A Some of the laboratories include a statement that this
18 profile has been seen in a database of this size. Some
19 people -- some laboratories report that since this profile has
20 been be obtained by searching a database of size N, the chance
21 of finding this coincidental match in a database is this.

22 Q Okay. So in your experience all labs provide the random
23 match, but some other labs will also provide the NP rule?

24 A Right.

25 Q Now is this -- this is the next page of People's 35 which
26 is entitled random match probability. Would you agree that
27 when you are assessing the random match probability that there
28 are two possible hypotheses that you're addressing? One, is

1 the individual the source of the evidence, or two, is this
2 person not the true source and is it a coincidental match; is
3 that a fair statement?

4 A Yes.

5 Q Would you agree that with respect to information provided
6 to a jury, that addressing the random match probability is a
7 relevant question?

8 A Yes, I -- that's my opinion. Yes.

9 Q And why is that?

10 A Well, that's what can be expressed in the simplest
11 language. Second, that's the statement that I can justify most
12 solidly based on my research, as well as cumulative knowledge
13 of population genetics. And if and when asked, additional
14 information can be given that the other persons can use to
15 define their strength or weight of the evidence --

16 Q Okay.

17 A -- on which I have less expertise.

18 Q Okay. So in terms of the weight of the evidence you
19 would leave that to the jury?

20 A Yes, because I do not want to give a false sense of
21 scientific security by making some assumptions on which I have
22 no knowledge.

23 Q For instance, the Bayesian approach?

24 A For example, Bayesian approach or prior probability.

25 Q Okay. Let me just kind of digress for a second.

26 Mr. Lynch asked you a number of questions about the articles
27 that deal with prior probability assumptions. Things like the
28 Bayesian theory, is that something that's new in the era of

1 cold hit cases or has the Bayesian theory of statistics been
2 discussed for a very long period of time?

3 A It's a pretty long time. As the name suggests, Mr. Bayes
4 B-A-Y-E-S, I think he is at least two or three centuries old.
5 So this concept has been in statistics for a pretty long time.

6 Q The statistical approach of using Bayesian in cold hit
7 cases -- well, in any case, criminal case, whether cold hit or
8 non-cold hit, would you agree that the Bayesian approach is not
9 generally accepted?

10 A I don't think it is generally accepted.

11 Q Now I'm going to show you here the next page of
12 People's 35 which is entitled databank match probability, the
13 NP rule. Would you agree when we're addressing that question
14 there's two hypotheses, one, the true source of the DNA
15 evidence profile is in the felon database, or two, the true
16 source of the DNA profile is independent of the felon database;
17 is that a fair statement?

18 A Yes.

19 Q Okay. Would you agree that when one is using the NP rule
20 that you are limiting your pool of suspects to the individuals
21 in the felon database?

22 A Yes.

23 Q Okay. And would you agree that when you are using the
24 random match probability you are including the entire human
25 population as a pool of -- I guess you could say pool of
26 suspects?

27 A Yes.

28 Q Okay. Would you agree that perhaps all the pool of

1 suspects may not be represented by the felon database?

2 A Maybe, yes.

3 Q Okay. I'm going to go here then to the next page of
4 People's Exhibit 35 and ask you, are you familiar with the
5 5.1 recommendation?

6 A Yes.

7 Q Do you recall the language of if one wishes to describe
8 the impact of the DNA evidence under the hypothesis that the
9 source of the evidence is someone in the database, then the
10 likelihood ratio should be divided by N; is that a fair
11 statement of the NP rule?

12 A Correct.

13 Q When we're talking about 5.1 there, does that make it
14 clear that we are dealing with the question of what is the
15 chance of finding a person in the felon database as opposed to
16 the entire human population?

17 A Yes.

18 Q You mentioned earlier that the best -- one of the best
19 statements of NRC-2 with respect to the cold hit cases was on
20 page 135.

21 A Correct.

22 Q Okay. I'm going to show you that page here and ask you,
23 are we talking about the language up here at the top?

24 A Yeah. I'm talking about what -- I was referring to the
25 third line of that page of 135 which says under the hypothesis
26 that the person leaving the evidence sample evidence is not
27 represented in the database of N persons, the simple upper
28 bound of the probability of M, meaning the match found in the

1 database, is given by NP.

2 Q Okay?

3 A So it is crystal clear that what the NRC-2 committee
4 members think that the presumption is the perpetrator has to be
5 from the database (notes are correct) so that you computer the
6 coincidental probability that a person live leaving the
7 evidence is not represented in the database is given by this
8 upper bound.

9 Q Okay. And are you saying then that the recommendation
10 5.1 is only addressing the question of the chance of the
11 coincidental match in the felon database as opposed to the
12 chance of a coincidental match in the entire population?

13 A Correct.

14 Q Now you've had some communication via email with Dr. Crow
15 from the NRC-2, who is the chair of NRC-2?

16 A Yes.

17 Q And did Dr. Crow agree with you that page 135 was pretty
18 clear in terms of what it meant?

19 A Yes.

20 Q I'm going to show you People's 37. Did you, first of
21 all, send this email to Dr. Crow in terms of the recommendation
22 of 5.1 of NRC-2?

23 A Yes.

24 Q And I'm going to show you the second page here in terms
25 of the response from Dr. Crow. And specifically, do you recall
26 Dr. Crow writing that I think the clearest statement in the
27 NRC-2 is on page 135. Under the hypothesis that the person
28 leaving the evidence sample is not represented in the database

1 of N persons, an upper bound on the probability that at least
2 one in the database match the match the evidence sample is NP.

3 He says then I think this agrees with what you say. We
4 state at the bottom of page 32 that this is assumed that the
5 database is small relative to the size of the population.

6 What does that mean there when we're talking about that
7 they assume the database is small?

8 A Small in comparison to the population of the whole world,
9 for example.

10 Q He also --

11 A Or size of the U.S. population.

12 Q Okay. He also goes on to say I might add that this was
13 written before the era of 13 loci and corresponding small match
14 probabilities and large databases of convicted persons. In
15 particular, we assumed that the database could be regarded as a
16 random sample of the population.

17 A Yes.

18 Q At the time that NRC-1 came out, would you agree that
19 there was very -- a small number of markers that were available
20 in felon databases?

21 A Yes. And they were not the markers currently being put
22 in the offender database.

23 Q In terms of the level of evolution in terms of the
24 technology, where have we gone since the time of NRC-1 with the
25 number of markers versus where we are currently with STRs?

26 A A whole lot advanced. For example, the number -- sheer
27 number of loci have increased. Second, we have removed the
28 so-called controversies or discussions on definition of match.

1 Q What you mean by that?

2 A Meaning the concept is no longer relevant. Third, is the
3 total discriminatory power of the loci, particularly when
4 relatives might be implicated, has increased dramatically. And
5 third, if not the most important, is by inclusion of all of the
6 validated loci the amount of time spent on investigating should
7 a suspect be identified through database search has
8 dramatically reduced.

9 Q Okay. If there -- hypothetically in this case if there
10 had been testimony that what we should be doing is only putting
11 in five or six loci and then using the other six or seven loci
12 for statistical interpretation, do you think that that is a
13 generally accepted procedure?

14 A No.

15 Q Why not?

16 A Because that would be, first, sort of providing the
17 community not a state of the art science. Second is the number
18 of investigations for coincidental matches might increase
19 dramatically. Third is it would be hard for a laboratory who
20 does both case work and as well as offender database
21 investigation to keep that separation without any logic of
22 science.

23 Q Would you agree that if you were to follow that logic and
24 only provide the jury with maybe six or seven loci statistical
25 interpretation, using that would you agree that you are not
26 providing the best estimate of the true rarity of the profile?

27 A Yeah, you are using -- you are giving them a sense of
28 false security without lessening, without reducing the number

1 of assumptions you're making.

2 Let me clarify. Suppose you get the -- you can clear the
3 evidence with 13 loci and you are putting only nine loci in the
4 database and therefore giving statistics based on the
5 additional four loci only following NRC-1.

6 Q Right.

7 A I don't think you are making any less number of
8 assumptions. You make the same assumptions. You make the
9 assumption that the modified product rule is valid and
10 therefore you can compute statistics best on the remaining four
11 loci. You make the same assumption that these 13 loci are
12 mutually independent. In other words, there is no linkage
13 disequilibrium. So while these are the issues that are being
14 contested in order to see what we are doing in random match
15 probability, or there is selection bias, quote unquote, in cold
16 hit searches, so what are you gaining. You are not getting rid
17 of those assumptions, but providing the community inappropriate
18 cumulative scientific knowledge by putting all the 13 loci in
19 the offender database.

20 Q Okay. So would you agree that you're not -- if you were
21 to follow NRC-1, you're not eliminating any of the substructure
22 assumptions?

23 A Correct.

24 Q But you are not providing a true estimate or the best
25 estimate of the true rarity of the profile?

26 A Correct.

27 Q And in particular, I'm going to show you here -- let's
28 assume hypothetically in this particular case that you started

1 out with a 13 locus match and the random match probability was
2 one in 650 quadrillion. If you were to only use four loci,
3 assuming hypothetically that you have one in 33,000 now as the
4 random match probability, if I were to tell you that
5 Dr. Mueller and Dr. Krane had testified that you could provide
6 the random match probability just on the four loci, would you
7 agree with that opinion?

8 A For those four loci, yes. That's the random match
9 probability. But --

10 Q Okay.

11 A -- that does not describe the full evidence in this case,
12 strength, weight, whatever you want to call it. It doesn't say
13 that well, this particular profile also matches with respect to
14 nine other loci.

15 Q Okay. With respect to if Dr. Mueller were to assert that
16 that's what we should be doing, using random match probability
17 on those four additional loci, would that be in contradiction
18 to how he's testified in the past about the product rule?

19 A I would interpret so.

20 MR. LYNCH: I'm going to object as to vague. Are we
21 talking about specific instances here?

22 MS. SCHUBERT: Well, I'll make it clear.

23 THE COURT: All right. Reframe the question.

24 Q (By MS. SCHUBERT) Are you aware that Dr. Mueller has
25 consistently testified that the product rule in his opinion is
26 not a valid scientific technique?

27 A Yes, he has testified --

28 MR. LYNCH: Your Honor, I'm going to object. I don't

1 believe there's any other time that Dr. Mueller has ever
2 testified regarding cold hit cases, and the only relevance is
3 in a cold hit case.

4 MS. SCHUBERT: Well, with all due respect, Dr. Mueller
5 said we could use the random match probability on the other
6 four loci. Yet in every other court proceeding he has
7 testified he doesn't think the random match probability is a
8 scientific -- a valid scientific technique.

9 MR. LYNCH: Your Honor, he testified that was the NRC-1
10 method, and of the methods that were available that was the
11 method he endorsed.

12 MS. SCHUBERT: Right.

13 MR. LYNCH: I don't see how that can be consistent with
14 anything unless we're dealing with other testimony in cold hit
15 case.

16 MS. SCHUBERT: It doesn't make any difference on whether
17 it's a cold hit or not, Judge. The random match probability
18 for the NRC-1 recommendation is the exact same random match
19 probability that you would use in any case, whether it's cold
20 hit or not cold hit. I'm simply trying to establish that
21 Dr. Mueller --

22 THE COURT: Just a second. Just a second. Dr. Mueller I
23 believe testified that you could come up with a probability
24 from four loci. But I don't know that the point of that
25 question was to go to whether he approved of the product rule
26 or modified product rule or some of those other issues. We
27 were talking about NRC-1's approach and how one could go
28 about applying that to this case. So I don't know that we

1 focused on -- I mean he, you know, focused on the variations of
2 the product rule, or interpretations of the product rule.

3 MS. SCHUBERT: Well, when he was here, whenever it was,
4 last week, a week before, I specifically asked him and he
5 testified that he has consistently advocated that the product
6 rule is not generally accepted. And so here we are in this
7 proceeding now where he's going to say it's okay to use the
8 product rule if we follow NRC-1. There's nothing different
9 about the random match probability on these four extra loci
10 versus the 13 loci. It's the exact same calculation. He just
11 thinks we should be using it in this particular case only on a
12 few markers, and it's a complete contrast to how he's
13 testified --

14 THE COURT: Well, did you ask him to reconcile why he
15 would say this and use the product rule here and not use it in
16 general?

17 MS. SCHUBERT: Well, we haven't finished his cross. He's
18 coming back on Wednesday.

19 THE COURT: Well, I think the key to this is to find out
20 what -- you know, because I don't think this is the proper
21 vehicle -- here he is at our direction trying to giving an
22 opinion as to whether you can utilize NRC-1 given a certain
23 situation of having nine loci and then four additional ones.
24 Now it seems to me the focus of that is the cold hit situation
25 and how we're going to deal with it. I don't see it as
26 defining precisely his interpretation of the product rule or
27 how you calculate the product rule.

28 MS. SCHUBERT: Okay. Well, I can clarify it with this

1 witness then.

2 Q Would you agree, Dr. Chakraborty, that whether it's a
3 cold hit case or not, if you follow the NRC-1's recommendation
4 the calculation for the random match probability is the same
5 use of the product rule?

6 A Yes.

7 Q There's nothing different about the random match
8 probability calculation under the NRC-1 recommendation as it is
9 in any forensic case, whether cold hit or non-cold hit?

10 A Correct.

11 Q Now I'm going to show you a declaration of Dr. Crow,
12 People's Exhibit 31. Have you had an opportunity to review
13 Dr. Crow's declaration in this case?

14 A Yes.

15 Q Do you agree with Dr. Crow that the random match
16 probability is general accepted in cold hit cases when
17 addressing the question of the rarity of the profile?

18 A Yes.

19 Q You agree that the rarity of the DNA profile is clearly a
20 relevant question for the trier of fact?

21 A Yes. That's my opinion.

22 Q And is that in fact exactly what the DNA Advisory Board
23 said when they came out with their article in Forensic Science
24 Communications?

25 A Yes.

26 Q And specifically under the database search section, this
27 is pretrial V, we've gone over this a number of times. But
28 we've always talked about two questions arising when a match is

1 derived from a database search. What is the rarity of the DNA
2 profile. And then later on you say these two questions address
3 different issues. That the different questions produce
4 different answers should be obvious. The former question
5 addresses the random match probability, which is often of
6 particular interest to the fact finder.

7 A Yes.

8 Q And then specifically when you start addressing the
9 latter question, meaning the NP rule, is that where you start
10 discussing the various articles written that we've talked about
11 in these court proceedings?

12 A Correct.

13 Q Mr. Lynch asked you about Stockmarr's article, and I'm
14 just going to show you the exhibit. I don't know which number
15 it is. But would you agree that with respect to the Stockmarr
16 article that we're talking about this article that the quote
17 unquote pool of potential suspects that you're limiting
18 yourself to the felon database?

19 A Yes.

20 Q Okay. And in particular -- in a forensic case would you
21 agree that perhaps the potential pool of suspects is not just
22 those individuals in the felon database but, rather, the entire
23 human population? Does that make sense?

24 A Yes.

25 Q Okay. And so would you agree that all of these articles
26 that we've talked about really is addressing what's the chance
27 of finding someone else here in the computer of felons as
28 opposed to what is the chance of finding someone in the general

1 population?

2 A That's how I would characterize or describe the
3 difference of the two questions as posed in the DAB
4 recommendation or as the difference between the concept of
5 random match probability and database match probability.

6 Q Okay. And when we're talking about the whole human
7 population, that's when we're seeking to address the question
8 of is this individual the true source of the evidence?

9 A Right.

10 Q Is it fair to say then that when we're talking about
11 question number two under the DAB guidelines, the NP rule, that
12 that is the question that has the various articles such as
13 Donnelly and Balding, those individuals talking about different
14 theories to answer that particular question?

15 A Here is a subtle difference. The answer -- short answer
16 is yes. But these articles come into relevance when you
17 translate the answer of the second question into another
18 statistical concept called likelihood ratio or a subsequent
19 step of posterior probability. The answer to the second
20 question can be stated in the database issues irrespective of
21 whether or not you assume that the true perpetrator has to be
22 in the database.

23 But once you get an answer to the second question, you
24 can formulate likelihood ratio with that stipulation. And even
25 with a further assumption you can translate that likelihood
26 ratio into a posterior probability of guilt.

27 Now I have trouble of those translations. In fact, very
28 few people can spell out what -- correctly what the additional

1 assumptions are, and even while a smaller proportion of
2 individuals can say those statistics in plain English without
3 getting into further fallacies of problems.

4 But the answer to these questions are crystal clear.
5 Everybody can understand it. I would -- without adding any
6 false sense of security I can answer those questions and give
7 foundations as to what are this implicit assumptions I make,
8 and how valid or approximate those assumptions are.

9 Q Okay. Now in terms of the two questions that the DNA
10 Advisory Board as well as other individuals have told us you
11 could have on cold hits that you -- would you agree that in
12 terms of answering number one, it is well accepted that the
13 random match is the appropriate statistical calculation?

14 A Yes.

15 Q Would you agree that with respect to the question number
16 two that the Bayesian approach as advocated by people like
17 Balding and Donnelly, Weir, is not generally accepted in the
18 scientific community? Does that make sense?

19 A I'm confused.

20 Q Okay.

21 A It would be inappropriate to say that Balding, Donnelly,
22 or Weir's answer -- computation answers question number two.
23 It is inaccurate to say that.

24 Q Okay.

25 A But their computations use the answer of question number
26 two and then makes use of further assumptions and go through
27 the computations.

28 Q Okay.

1 A The answer --

2 THE COURT: Well -- keep going.

3 THE WITNESS: The answer to question number two forms the
4 basis of their computations. But they try to get answers to a
5 farther question where the definition of strength or weight has
6 to use additional assumptions.

7 Q (By MS. SCHUBERT) Okay. And the additional assumptions
8 are the prior probabilities, correct?

9 A One of them is a prior probability.

10 Q Okay.

11 A The second is the pool of suspects in which the
12 perpetrator must reside.

13 Q Okay.

14 THE COURT: What about exclusion? I thought the
15 exclusion idea played some role in their calculation of the
16 random match probability.

17 THE WITNESS: Right. When Donnelly and Balding say that
18 the NP rule, N times P gives a less weight, in their definition
19 of weight they include that there are all but one individuals
20 in the database who did not match or who were excluded. So in
21 their definition or in their concept of the weight they also
22 include that all but one individuals in the database was
23 excluded as a contributor.

24 THE COURT: But I'm getting back to what you just said,
25 because I was confused until you said that, it strikes me that
26 Balding and Donnelly are not just answering question number two
27 but are striving to answer question number one, are they not?

28 THE WITNESS: In a sense, yes, but with that additional

1 assumption.

2 THE COURT: All right. With additional assumptions. But
3 earlier the questions of Ms. Schubert suggested that they were
4 only addressing question number two.

5 THE WITNESS: That's why I --

6 THE COURT: That's why you corrected her.

7 THE WITNESS: Correct.

8 THE COURT: Good.

9 MS. SCHUBERT: I'll take that.

10 Q Now would you agree, Dr. Chakraborty, that with respect
11 to the random match probability and the use of that calculation
12 in cold hit cases, that that is generally accepted world wide?

13 A Yes. That would be my opinion based on seeing what the
14 forensic laboratories are using as statistics in cold hit
15 cases.

16 Q Okay.

17 A But I should also -- for completeness I should also say
18 most of these laboratories -- many of these laboratories are
19 also reporting that should that case be a cold hit case, the
20 size of the database.

21 Q Okay. So they are providing the size of the database
22 should someone want to do an NRC-2 --

23 A Right.

24 Q -- approach? Okay. Now would you agree that with
25 respect to the DNA Advisory Board not only are you recommending
26 or endorsing the NRC-2 approach, but you are in fact endorsing
27 the random match probability to assess the rarity of the
28 profile?

1 A Yes.

2 Q Would you agree that in a cold hit case that the NRC-2
3 recommendation does not provide the best estimate to the jury
4 of the rarity of the profile, rather that the random match
5 probability does?

6 A Yes, because I think the statement on page 135 of NRC-2
7 speaks for itself. It provides the chance of finding that
8 profile -- it presents an upper bound for chance for finding
9 that profile in a database of certain size. So clearly its
10 weight or strength is far weaker than the random match
11 probability.

12 Q Okay. Have you ever seen any literature that says that
13 in a cold hit case that the random match probability is not a
14 relevant statistic to provide to a jury?

15 A I have not seen any publication to that effect. In fact,
16 in contrary, whatever has been written in the context of cold
17 hit cases start with the premise of random match probability.
18 Capital P or small P in the language of these complicated
19 mathematics is nothing but the random match probability. So my
20 understanding of all of this logic is everybody agrees the
21 random match probability still is the same no matter whether it
22 is a cold hit or probable cause scenario.

23 Q Okay. Let me give you a hypothetical based on some
24 testimony last week. If you had a case, a criminal case, where
25 say there was a child homicide, sexual assault and the police
26 had no suspects and they went out and collected samples from
27 ten people voluntarily and they happened to match one of those
28 people that -- not because they thought they were a suspect,

1 but maybe generally they matched the description. Do you think
2 under those circumstances that you should modify the statistic
3 or that you should use a statistic based on NRC-1's
4 recommendation?

5 A It's a complete misuse of even NRC-1's recommendation.
6 This is the reason why this sort of recommendation can get
7 misused. If the police investigated ten persons based on some
8 extraneous information, this is no longer a cold hit case. So
9 I do not see how the NRC-1 rule applies here.

10 Q What if they just went out to the neighborhood and just
11 voluntarily collected samples from individuals? Does that make
12 it a cold hit case if that DNA profile is never put into the
13 actual felon database?

14 A I don't think it's a cold hit case.

15 Q Are you aware of any laboratories that will modify their
16 statistics or change their statistical interpretation if they
17 had collected samples from ten people?

18 A I have not heard of any laboratory that does that.

19 THE COURT: I assume we have a little further to go.

20 MS. SCHUBERT: I'm getting close, Judge.

21 THE COURT: Well, I'm close to the end of my capacity --

22 MS. SCHUBERT: I'm trying to finish because we did try to
23 change his flight for tomorrow morning.

24 THE COURT: What?

25 MS. SCHUBERT: We changed his flight, so that's why I'm
26 trying to -- I'm just about done, Judge.

27 THE COURT: I'm just suggesting we take a five minute
28 break.

1 MS. SCHUBERT: I thought you were going to say --

2 THE COURT: Oh, no. I wouldn't end proceedings at this
3 point. So let's take a few minutes here, five or eight
4 minutes. It allows people to unwind and get to facilities.
5 We'll come back shortly.

6 (Proceedings in recess.)

7 THE COURT: All right. The record will show all parties
8 have returned.

9 THE WITNESS: I need to be wired.

10 THE COURT: Yes, you need to be hooked up. I think our
11 court attendant had a commitment elsewhere, like illness or
12 something. So we'll get along without her, since we don't have
13 a junior or a lot of witnesses to process.

14 Let us continue.

15 Q (By MS. SCHUBERT) Dr. Chakraborty, in terms of the
16 NRC-2's recommendation, did you in addition to sending an email
17 to Dr. Crow, did you also send one to Dr. Tom Nagylaki,
18 N-A-G-Y-L-A-K-I?

19 A Yes.

20 Q He was a member of NRC-2?

21 A Yes.

22 Q And I'm going to show you People's 38, and is that the
23 reply that you got Dr. Nagylaki in terms of your interpretation
24 of NRC-2?

25 A Correct.

26 Q And in that email from Dr. Nagylaki, did he agree that --
27 did he agree with your interpretation of NRC-2's
28 recommendation?

1 A Yes.

2 Q I'm going to show you a couple other emails. These have
3 not been marked, but I will just ask you if you know of these
4 people. Have you have heard of a person by the name of
5 Theodore Kessis from Columbus, Ohio?

6 A No, I have not heard about this person, although Columbus
7 is about 150 miles from Cincinnati where my present work is. I
8 haven't heard of this person.

9 Q How about this person, Ronald Ostrowski?

10 A Also -- I also do not know him. I do not know where he
11 is.

12 Q Okay. I'm going to show you here an email from Stephen
13 Stigler. You're familiar with him, right?

14 A Yes.

15 Q Was he on NRC-2?

16 A Yes -- wait a minute. Yes. He's of NRC-2, you mean.

17 Q Yes. And would you agree with his statement in the email
18 to Dr. Krane that the first panel included no statisticians on
19 that panel?

20 A Yes, I agree with him.

21 Q Would you agree with Dr. Stigler -- I'm not sure, is
22 Stephen Stigler a doctor?

23 THE COURT: When you say the first panel --

24 MS. SCHUBERT: NRC-1.

25 THE COURT: NRC-1.

26 Q (By MS. SCHUBERT) Would you agree with Dr. Stigler's
27 statement that the procedure advocated by NRC-1 is illogical
28 and akin to discarding all evidence that leads to an arrest

1 when you hold a trial this not conservative, it is
2 self-blinding?

3 A Yes. In a sense I agree with him.

4 Q What sense, if you can explain that for us?

5 A Because the fact that this person matched with respect to
6 a set of loci, ignoring that altogether means as if that
7 information did not exist.

8 Q Okay.

9 A And that, as discussed subsequent to NRC-2's
10 recommendation by various scientists, can give weight.

11 Q Okay.

12 A So ignoring that weight and saying that we know nothing
13 of that is nothing but having some information and just washing
14 it out.

15 Q I'm going to read you the bottom -- one of the last
16 paragraphs here. He writes an important statement in the
17 second NRC report is that of appendix 5B, pages 163 to 165.
18 When that appendix is properly understood the approach we
19 advocated is not at serious variance with the approach
20 advocated by Donnelly et al if they use a sensible prior.

21 A Correct. I agree with him.

22 Q Okay. Do you agree with him in the last paragraph here
23 where he says I do not think there is at present a serious
24 fundamental split, although different people do choose to
25 describe things in different ways?

26 A Yes. That's what I tried to say in my direct testimony.
27 That when a database search is made to identify a suspect, then
28 multiple questions can be asked, answers of which are obviously

1 different, and then one can take any of the discussions, make
2 additional assumptions, and define their strength or weight.
3 And that's what the current literature reflects. There is no
4 fundamental split as to that. This concept becomes meaningless
5 in the context of -- the split being defined as some concepts
6 become fundamentally flawed in the case of cold hits. There is
7 no such statement or there is no such discovery. So I agree
8 with Steve where he says there is no fundamental split. Yes,
9 in case of cold hits you can ask additional questions and get
10 obviously different answers. And then you can use those
11 answers to do further things with additional assumptions. So
12 he does not define a split or conflict or confusion or
13 controversy.

14 Q Okay. Would you agree with NRC-2's recommendation at
15 page -- or comment at page 203 that when we're talking about
16 the different questions and different answers that this
17 statement is appropriate in the sense to make appropriate use
18 of DNA technology in the courtroom, the trier of fact must give
19 the DNA evidence appropriate weight. However, unless the
20 results and meaning of the DNA evidence are clearly
21 communicated, a trier of fact may fail to grasp the technical
22 merits of DNA profiling.

23 A I agree with that completely.

24 Q If I didn't say it, I think that is page 203.

25 THE COURT: You did say it.

26 MS. SCHUBERT: Of NRC-2.

27 Q I'm going to show you an exhibit here, People's 32, and
28 ask you if you would agree that these could be two questions

1 for the jury to consider. And I know we've gone over this a
2 number of times, but I want to just ask you, number one, is the
3 defendant the true source of the DNA evidence. Would you agree
4 that the random match is the appropriate calculation?

5 A Yes.

6 Q Would you also agree that you can provide calculations
7 for relatives?

8 A Yes.

9 Q Would you agree that NRC-2 makes recommendations if there
10 is a possibility that a relative is included in the pool of
11 suspects?

12 A Yes.

13 Q Is that calculation generally accepted in the scientific
14 community?

15 A Yes.

16 Q Would you agree that the other question the jury might
17 consider is what is the chance of scoring a hit on any
18 particular profile in felon databank?

19 A Yes.

20 Q Would you agree that that is -- that chance is the NP
21 rule, but in addition to that, the exclusion factor may be
22 relevant for the jury to consider?

23 A Yes.

24 Q Finally, Dr. Chakraborty, would you agree -- well,
25 actually one or two questions before that final question.
26 Mr. Lynch asked you a number of questions about grants that had
27 been supported by NIJ. Are there grant supports that you
28 received from NIJ that have medical implications as well?

1 A Yes, it does. In fact, the current CODIS 13 loci are
2 also the loci that the medical genetic epidemiologists use to
3 find out whether there are inherent differences of population
4 substructure between cases and controls when they do standard
5 case control study in clinical trials or disease gene
6 association studies.

7 Q And I noticed on your c.v. is it true that at least one
8 of those grants, the current grants you have deals with cancer
9 research?

10 A Yes.

11 Q Okay. And is there another one that deals with radiation
12 or something of that nature?

13 A Yes.

14 Q Those are not specifically entitled forensic types of
15 grants?

16 A No.

17 Q With respect to your consulting in particular cases,
18 Mr. Lynch asked you if you're paid for those. If you review a
19 case for either the prosecution or the defense, do you
20 personally gain any of those monies?

21 A No.

22 Q Since -- well, let me ask you, what year was the first
23 year that you have testified in a forensic case?

24 A I think my -- I first testified in 1991 or 1992,
25 beginning sometimes.

26 Q Since that time in 1991 or '92, have you personally
27 received money that went into your own pocket?

28 A No.

1 Q And then finally, I just wanted to ask you in terms of
2 these statistics that we've been talking about, the various
3 statistical approaches whether cold hit or not, is there
4 anything new or novel in terms of the scientific technology or
5 the technique about any of these statistical theories?

6 A In my opinion, no.

7 MS. SCHUBERT: I think that's all I have.

8 THE COURT: All right. Mr. Lynch.

9 RECROSS-EXAMINATION

10 BY DAVID LYNCH, Assistant Public Defender, Counsel for the
11 Defendant:

12 Q You say that's there's nothing new or novel about the
13 statistical theories. Is it fair to say this debate over the
14 application of statistics in cold hit cases is a relatively
15 recent debate that was sparked by the publication of NRC-2?

16 A I don't view that.

17 Q Was the debate going before the NRC-2 was published?

18 MS. SCHUBERT: I'm going to object to the use of the word
19 debate. That misstates his testimony.

20 THE COURT: Sustain the objection. Reframe your
21 question.

22 Q (By MR. LYNCH) Were the articles that have been
23 published and reviewed by you, by Balding and Donnelly and
24 Stockmarr and company, those articles were published since the
25 NRC-2 report, correct?

26 A Yes.

27 Q And so the application of the statistics to cold hits,
28 the disagreement amongst those parties has been aired within

1 the last five years, correct?

2 A That's what I really object to in the sense that I don't
3 consider those articles as disagreement. These articles define
4 their strength or weight in different ways. And obviously
5 therefore they get different answers. Now the strength or
6 weight is a very subjective concept one can define in their own
7 way and get a different answer. I would agree with every one
8 of those articles if I'm allowed to answer their question and
9 allowed to make their assumptions. Now in the context of a
10 legal case, discussion in court, I'm not sure whether I'm based
11 on my expertise can make those additional assumptions, so I
12 rather would define my strength or weight more objectively and
13 answer the question much more simply.

14 Q Moving on to prosecution 35, two questions can be asked
15 when a cold hit, that first question, what is the chance of
16 finding a coincidental match in the felon database, that is the
17 question that the DMP, the database match probability, attempts
18 to answer, correct?

19 A Correct.

20 Q The second question there, what is the chance of finding
21 another unrelated person in the entire human population that
22 also matches the evidence, is it fair to say that that
23 question, while similar to the question for the random match
24 probability is actually getting pretty close to if not the
25 prosecutor's fallacy by talking about another unrelated person
26 that falsely matches the evidence?

27 A I'm not a legal expert, so I do not know whether I'm
28 qualified to define prosecutor's fallacy. But again today I

1 read NRC-2, and as I understand NRC-2 prosecutor's fallacy
2 would be if you get the answer of that question and just
3 reverse the conditioning and express random match probability
4 in terms of likelihood of the hypothesis instead of likelihood
5 of data given hypothesis.

6 Q So if you state the --

7 THE COURT: Just a second. A data -- what was the word
8 you used? Given?

9 THE WITNESS: The hypothesis as opposed to likelihood of
10 hypothesis given the data.

11 Q (By MR. LYNCH) So if you state the random match
12 probability statistic one in 650 quadrillion as telling us the
13 chance that somebody other than the defendant left the profile,
14 that would be incorrect?

15 A No. That would be a wrong interpretation of random match
16 probability.

17 Q Okay.

18 A If I said what is the chance of finding this profile in
19 another person, I can answer that question by computing random
20 match probability.

21 Q Surely the random match probability asks what is the
22 chance of finding that profile in a person unrelated to the
23 evidence donor, correct?

24 A Correct.

25 Q Okay. And this question puts in the term "another," and
26 "also" which suggests we're comparing a defendant with a third
27 person, correct? Or with another person?

28 A (No response.)

1 Q This question doesn't precisely state the question that
2 the random match probability accurately answers, does it?

3 A I don't understand your question. I would answer that
4 question by computing the random match probability, but I will
5 explain the random match probability. This is the probability
6 that of -- it is expected chance that another person will have
7 the same profile. This is not -- in my understanding of
8 prosecutor's fallacy, there is no fallacy at all.

9 Q With a further page entitled random match probability,
10 two hypotheses, you'll see in prosecutor's 35 two hypotheses:
11 One, defendant is the true source of the evidence and, second,
12 defendant is not the true source.

13 A Correct.

14 Q Does the random match probability directly tell us the
15 chance whether the defendant is the source as opposed to is not
16 the source, or does it instead just give us an indication of
17 how unlikely it would be for a random person to happen to
18 match?

19 A It gives an implication, yes.

20 Q So the random match probability doesn't directly answer
21 the question whether the defendant is the true source of the
22 evidence?

23 A Does not directly answer that question, yes.

24 Q Further on prosecution 35 we have the databank match
25 probability, colon, NP rule, and there are two hypotheses under
26 that. First hypothesis is that the true source of the DNA
27 evidence -- we'll call the donor -- is in the felon database.
28 And the second hypothesis is essentially that the donor -- the

1 wording is independent of do. You interpret that to mean is
2 not in the felon database?

3 A Yes.

4 Q So the two hypotheses is the true donor is in the felon
5 database and the other hypothesis is the true donor is outside
6 the felon database?

7 A Yes.

8 Q Does anyone try to answer the question what is the chance
9 that the true donor is or is not in the felon database?

10 A The way you write two hypotheses, you are always making
11 an implication of what the number is. Here the NP rule can be
12 translated into a likelihood ratio as stated by NRC-2 --

13 Q Okay. But --

14 A -- and that the two hypotheses are these. In the
15 previous exhibit we translate -- we were trying to implicate or
16 translate the random match probability into a likelihood ratio,
17 and the two corresponding hypotheses were stated. So here
18 again the two hypotheses here are the contrasting two
19 hypotheses that are being compared in a likelihood ratio
20 concept should you use the answer to the question number two as
21 framed by DAB.

22 Q Okay. But the likelihood ratio form of the NP rule is
23 not assessing the likelihood that the true source is in or out
24 of the database, is it? It's addressing two different
25 hypotheses?

26 A The -- well, one over NP becomes the likelihood ratio if
27 you contrast these two hypotheses.

28 Q Okay. You're saying that the NP rule as translated into

1 a likelihood ratio compares the hypothesis that the person is
2 in the database as opposed to is not in the database?

3 A Not person. The profile.

4 Q Okay.

5 A Yeah.

6 Q The true donor is in the database?

7 A Is the source of the profile in the database versus not.

8 Q And you're saying that's what the likelihood ratio
9 calculates?

10 A Yes.

11 Q I think there's been some confusion. Probably it's a
12 good time to try and explain this.

13 Recommendation 5.1 underneath the bold-face type has a
14 comment -- the district attorney's read it before -- if one
15 wishes to describe the impact of the DNA, et cetera, et cetera,
16 the likelihood ratio should be divided by N. I want to see if
17 I'm understanding this correctly. My understanding is the
18 likelihood ratio can in many ways be calculated from the random
19 match probability.

20 A Yes.

21 Q And so the likelihood ratio is in simple cases considered
22 to be one over the random match probability?

23 A Correct.

24 Q In that recommendation, in that statement on the board,
25 the likelihood ratio should be divided by N, are they
26 suggesting that the database likelihood ratio is one over the
27 random match probability? And when we say divided by N we put
28 that on the denominator like that?

1 A Correct.

2 Q So essentially what that is saying is if you want to
3 convert the NP rule into a likelihood ratio, you invert it, one
4 divided by NP?

5 A Correct.

6 Q Okay.

7 THE COURT: Divided by what?

8 MR. LYNCH: NP.

9 THE WITNESS: N times P.

10 MR. LYNCH: N times the random match probability. NP.

11 Q So they're not saying that -- consume a lot paper, I'm
12 afraid.

13 They're not saying that you take the NP rule, to convert
14 it into a likelihood ratio that you divide by N and the N drops
15 out and we get back the P? They're not saying that, are they?

16 A No.

17 Q They're not saying that you get back to P or the random
18 match probability when they say that?

19 A No.

20 Q I'll put a big X through that to indicate that that's
21 incorrect.

22 You talked a lot about the recommendation on page 135 of
23 NRC-2. And they do go through the database search issue
24 estimating the chance that the evidence sample is not
25 represented in the database. Is it fair to say at the end that
26 they talk about other situations besides the simplified one
27 that they have talked about might not be so simple?

28 A I do not know what you're referring to now.

1 Q Right at the bottom where they have talked about -- they
2 have simplified down a formula, a rather complex formula, and
3 reduced it to NP as their justification for getting to NP?

4 A Correct.

5 Q And fair to say at the end they concede that other
6 situations other than the very clean and simple example given
7 might not be as simple?

8 A Correct.

9 Q And they're essentially in that sentence conceding that
10 there are in fact complexities that arise that would alter the
11 assumptions and thus the validity of the NP rule?

12 A Yes.

13 Q Now you have suggested that the question that Balding and
14 Donnelly are asking -- well, they don't specifically ask what
15 is the rarity of the profile, do they?

16 A No, but they use it.

17 Q They use the random match probability in order to address
18 the overall significance of a cold hit match?

19 A Correct.

20 Q And they describe that in terms of a likelihood ratio?

21 A Correct.

22 Q Which while it's, they admit, seems opposite to NRC-2
23 because it strengthens the evidence, correct?

24 A Yes.

25 Q That ultimately the prior probability that we find so
26 hard to estimate actually will reduce again the significance of
27 the match overall?

28 A Yes. If you use their prior probability and disregard

1 realities such as violent crimes are perpetrated by repeat
2 offenders and so on. If you disregard that reasonable
3 assumptions, you can dilute the strength of the evidence.

4 Q Now the district attorney earlier asked you a
5 hypothetical, if we went out and we looked at ten people that
6 matched a general description would that be a database search
7 type case for purposes of statistics, correct? Do you remember
8 that question?

9 A Yes.

10 Q Okay. And it's fair to say that in her hypothetical she
11 gave some justification for suspecting those people initially?

12 A Correct.

13 Q Okay. Take my hypothetical where a crime has occurred
14 and we have a 13 locus match from the -- a 13 locus profile
15 from the evidence and, frustrated, we go out and randomly
16 collect ten people from the population and we test all ten and
17 we look down our list of results and we see if any of those
18 happen to match. Would that be analogous to a cold hit
19 database search?

20 A Yes, if you took these ten persons as the source of your
21 perpetrator and went ahead and created a database.

22 Q So the significance isn't necessarily -- strike that.

23 The significance that makes something analogous to or
24 statistically treatable as a database case is the fact that
25 essentially there's very minimal, if any, cause to suspect any
26 individual person in that database?

27 A What is the question you're asking?

28 Q Well --

1 A You made a statement.

2 Q I understand. When you talked with the district attorney
3 you said that wouldn't be a database case. When I gave you my
4 hypothetical where we'd gone out at random and looked at ten
5 people, you concluded that would be a database case. And my
6 question to you is the difference -- or the reason that a case
7 becomes a database search case is because of the fact that the
8 number of people have been selected when there is no real
9 reason necessarily to suspect them initially; is that fair to
10 say?

11 A Yes.

12 Q Okay. So if you search through a hundred people when you
13 have no real suspicion of anyone in general, that again is a
14 database case?

15 A Yes, if you assume that one of those hundred could be a
16 perpetrator.

17 Q Okay. So you don't even necessarily have to formally or
18 physically put these profiles into a database, just comparing
19 them out of a lab book of results would essentially mean that
20 the statistics and the chance of finding the person
21 accidentally would apply?

22 A Yes.

23 Q The district attorney showed you prosecution 32, question
24 one, is the defendant the true source of the DNA evidence.
25 Again, I hate to belabor this point, but the random match
26 probability does not directly answer that question, does it?

27 A No, it is used to answer that question. The random match
28 probability per se does not answer the source attribution

1 statement. It is used to some computation based on certain
2 other information such as the calculation for relatives.

3 Q So you would take the random match probability that
4 answers the question what is the chance a random, unrelated
5 person would happen to match, and you take that answer and you
6 need to use inferences to determine whether that means the
7 defendant is actually the source of the DNA evidence?

8 A Yes.

9 Q Okay. Now the second question there, what is the chance
10 of scoring a hit, presumably meaning a match, on any particular
11 profile in the felon databank and under that it's written that
12 chance is the NP rule?

13 A Correct.

14 Q Now that NP ruled directly addresses that second
15 question, doesn't it?

16 A Again, it is used to make an inference.

17 Q Well, the NP rule directly states that an outside limit
18 for the chance of scoring a match on a profile in the felon
19 databank is NP?

20 A Is at most NP.

21 Q Okay. The district attorney asked you about a couple
22 communications you had via email. I believe she first talked
23 about Dr. Crow. Did you indicate you've had personal
24 communications with Dr. Crow on this specific subject recently
25 or is it just the email?

26 A It is just the email.

27 Q Okay.

28 A That's the most recent.

1 Q Okay. So your email, you gave some information on what
2 you considered was happening in this court, court case, and
3 what your opinion was; fair to say?

4 A Right.

5 Q And his response -- I think we may have to zoom out here.
6 Refer you to page 135.

7 A Correct.

8 Q And that again gives an upper bound on the probability
9 that at least one person in the database happens to match?

10 A Correct.

11 Q He doesn't go into any other detail about the random
12 match probability, correct?

13 A No, but let's see. The second single sentence, I think
14 this agrees with what you say.

15 Q Okay. This meaning the above paragraph?

16 A Right.

17 Q Okay. You wrote that same email with the same
18 information about what you thought was going on in the court
19 case and what your opinion had been to date. You wrote that
20 also to Tom -- who are we talking about? Nagylaki? That's
21 Dr. Nagylaki?

22 A Correct.

23 Q You wrote that same information to him about what you
24 consider to be going on in the case in your opinion?

25 A Correct.

26 Q And his response to you was essentially you are correct?

27 A Yes.

28 Q Colon, we are giving an upper bound to your --

1 A Number one.

2 Q -- Roman numeral one, lower case, correct?

3 A Yes.

4 Q And that referred to statements in your letter, email

5 letter?

6 A Right.

7 Q Okay. Where is your one?

8 Okay.

9 A What is the chance of finding such a profile in at

10 least -- such a profile at least once in N persons.

11 Q That's the database question?

12 A Correct.

13 Q And you say that that is dealt with by approximately N

14 times P?

15 A Correct.

16 Q With a few qualifiers?

17 A Yes.

18 Q And so he agrees you are correct, colon, in the same

19 sentence we are giving an upper bound to your question one?

20 A Correct.

21 Q Doesn't say anything to you about the random match

22 probability and that question, does it?

23 A He is using my answer where P is the random match

24 probability, so he's agreeing with me the random match

25 probability is the concept built in in answer to question

26 number one.

27 Q Well, yes, in the NP rule we're always going to have to

28 deal with the random match probability because the random match

1 probability is P.

2 A Right.

3 Q We have to deal with it.

4 A Yes.

5 Q But do either of these emails state that we think there
6 are two questions that should be asked and there are two
7 questions that should be addressed for the trier of fact;
8 namely, random match probability and NP to either?

9 A That is what we said in DAB.

10 Q I know, but --

11 A And all of these commentators or members of NRC-2 are
12 saying yes, you are correct, two questions can be asked. In
13 NRC-2 we were responding to your question number one; namely,
14 what is the chance of getting this profile in a database of
15 size N.

16 Q They don't explicitly say all that? That's what you
17 infer from their responses, correct?

18 A Unless I'm mistaken, I think I -- we can show this
19 communication to a hundred persons and try to find out what
20 they mean.

21 Q Okay.

22 A It is as fundamental as A is the first alphabet of the
23 English language.

24 MR. LYNCH: I don't have any further questions.

25 MS. SCHUBERT: I just have one or two.

26 FURTHER REDIRECT EXAMINATION

27 BY ANNE MARIE SCHUBERT, Deputy District Attorney:

28 Q On People's Exhibit Number 32 here, Mr. Lynch asked you

1 if question number one if you can really give source
2 attribution in providing the random match probability. Would
3 you agree that there are many laboratories that in fact will
4 give source attribution based upon the random match
5 probability?

6 A Yes, together with additional information just as how
7 many loci and then the calculations for relatives, yes.

8 Q If you were to have a statistic of one in 650 quadrillion
9 using 13 loci, would you agree that there are many labs,
10 including the FBI, that would identify the defendant as the
11 source of that evidence?

12 A Yes, they will.

13 Q And in addition to the FBI are there other laboratories
14 that do that?

15 A Yes, there are other laboratories. Particularly in the
16 state of New York, in the state of Texas they will.

17 MS. SCHUBERT: I think that's all I have.

18 THE COURT: Mr. Lynch.

19 MR. LYNCH: Your Honor, I just would ask the witness to
20 authenticate my copies of the emails. I apologize. If we can
21 get cleaner copies maybe marked, I have highlighted on mine.

22 But would you agree, Dr. Chakraborty, those are copies
23 that you printed out and provided to the district attorney?

24 THE WITNESS: Yes.

25 MR. LYNCH: Or maybe she printed them out. But are those
26 accurate copies, the one from JF Crow at Facstaff, and I'm
27 looking for the other email address. Who is this one from?
28 This is --

1 THE WITNESS: This is Tom.

2 MR. LYNCH: That one appears to be an accurate portrayal
3 of your communications?

4 THE WITNESS: Yes, because in one attempt I mistyped
5 Dr. Crow's initial and it got bounced back.

6 MR. LYNCH: Okay.

7 THE WITNESS: Anyway, yeah.

8 MR. LYNCH: These are accurate portrayals?

9 THE WITNESS: Yes.

10 MR. LYNCH: Thank you. I have nothing further.

11 THE COURT: Ms. Schubert.

12 MS. SCHUBERT: That's all I have, Judge.

13 THE COURT: Excellent.

14 THE WITNESS: I can go home?

15 THE COURT: You can go home, Doctor.

16 THE WITNESS: Thank you.

17 THE COURT: We thank you very much. If you'll unhook
18 yourself there, you can then be free to depart.

19 MR. LYNCH: Would it be inappropriate to ask the clerk to
20 copy the actual pages of those emails that he authenticated and
21 have them marked, the unhighlighted ones? I don't know that it
22 would be appropriate to provide --

23 THE COURT: If we can get copies of the unhighlighted
24 ones, I would think those should be marked.

25 MS. SCHUBERT: We could do it tomorrow.

26 MR. LYNCH: I'll bring them back some other day.

27 ---o0o---

28 (Proceedings recessed to Wednesday, January 29, 2003)

1 9 a.m., this department.)

2 ---o0o---

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